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Accessing the Future

The Intermodal Transportation Plan for the Commonwealth of Massachusetts

GOVERNMENT DOCUMENTS
COLLECTION

1995

JUL 25 1996

UNIVERSITY OF MASSACHUSETTS

Prepared by the

*Executive Office of Transportation and Construction
Bureau of Transportation Planning and Development*

in Cooperation with

*Federal Highway Administration
Federal Transit Administration
Executive Office of Environmental Affairs
Executive Office of Economic Affairs
Governor's Highway Safety Bureau
Massachusetts Highway Department
Massachusetts Bay Transportation Authority
Massachusetts Aeronautics Commission
Massachusetts Port Authority
Massachusetts Turnpike Authority
Massachusetts Association of Regional Planning Agencies
Massachusetts Association of Regional Transit Authorities*

with Assistance Provided by

*Massachusetts Regional Planning Agencies
Boston MPO Central Transportation Planning Staff
Cambridge Systematics, Inc.
Howard/Stein-Hudson Associates*

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The Commonwealth of Massachusetts
Executive Office of Transportation and Construction
Ten Park Plaza, Boston MA 02116-3969
Office of the Secretary

William F. Weld
Governor

Argeo Paul Cellucci
Lieutenant Governor

James J. Kerasiotes
Secretary and MBTA Chairman

November 20, 1995

The Honorable Robert A. Havern, III, Chairman
The Honorable Thomas S. Cahir, Chairman
Joint Committee on Transportation
State House, Room 443
Boston, MA 02133

Dear Senator Havern and Representative Cahir:

It is my pleasure to submit *Accessing the Future, the Intermodal Transportation Plan for the Commonwealth of Massachusetts*, in fulfillment of the requirements of Chapter 102 of the Acts of 1995, Section 3. *Accessing the Future* outlines a bold set of policies that will shape our transportation system from the present to beyond the year 2020.

Accessing the Future was developed through an unprecedented cooperative effort of the Commonwealth's transportation providers, the Executive Office of Environmental Affairs, the Executive Office of Economic Affairs, the Massachusetts Regional Planning Agencies, and the citizens of Massachusetts. The extensive public involvement process, which included over 15 public meetings, solicited and received input from private citizens, local elected officials, the business community, and interest groups.

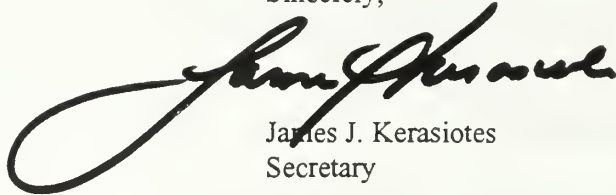
Consistent with State and Federal legislation (including the Intermodal Transportation Efficiency Act of 1991 and the Clean Air Act Amendments of 1990) *Accessing the Future* outlines an aggressive highway and transit program of necessary maintenance and vital system expansions in excess of \$16 billion through the year 2020, including the \$5 billion remaining commitment to complete the Central Artery/Tunnel project. This commitment to maintain and expand the Commonwealth's transportation system is reflected in the most recently approved State Transportation Improvement Program (covering the period of October 1, 1995 through September 30, 1997) which programs specific highway and transit projects that total over \$2.5 billion.

Accessing the Future also describes a major new initiative to develop six management systems, scheduled to be fully operational in 1997, that will provide necessary engineering data and assessments for the Commonwealth's roads, bridges, and transit facilities. These management systems will provide information concerning condition, safety, and performance to ensure that our transportation system provides the quality of travel that our citizens deserve.

Finally, starting February 1, 1996, an annual report will be filed that summarizes our efforts, specifying the actual projects undertaken and completed each calendar year, as well as funds expended. Quarterly reports which summarize the total value of all contracts awarded and funds expended will also be filed.

Accessing the Future will be updated on a regular basis. Our goal is to provide a transportation system that is a model for the country. I look forward to working with the public officials and citizens of the Commonwealth in achieving that goal, and I encourage your continued participation in setting the course for the Massachusetts transportation system. I am sure that you will agree that by making sound investments in our transportation systems today, all Massachusetts citizens will be able to *Access the Future*.

Sincerely,

A large, stylized handwritten signature in black ink, which appears to read "James J. Kerasiotes". The signature is fluid and cursive, with a large loop at the beginning.

James J. Kerasiotes
Secretary

INTRODUCTION TO ACCESSING THE FUTURE

An efficient transportation system is crucial to the economic vitality and livability of Massachusetts. *Accessing the Future, the Intermodal Transportation Plan for the Commonwealth of Massachusetts*, was developed to guide our transportation decisions into the 21st century. The challenge that we face is daunting: to ensure maximum mobility for everyone that lives or conducts business in Massachusetts in an era of constrained financial resources. As we face this challenge, we must also continue to foster economic growth and protect our environment. We believe that this challenge can be met; *Accessing the Future* is an important step in meeting it.

Accessing the Future is divided into three parts. Part One, Advancing Our Mission, focuses on the mission of our transportation system, as well as the policies, goals, and objectives that need to be accomplished to achieve that mission.

Part Two, Foundations for Planning, presents discussions of the undepinnings of our transportation planning process in Massachusetts. First, a description of the extensive Massachusetts transportation system is presented, including a summary of how it is used and by whom. The next two chapters summarize the regulatory framework within which transportation planning must be accomplished and how Massachusetts is responding to these regulatory requirements. Part Two continues with discussions of three issues that cut across the fabric of our transportation planning process: the role that transportation plays in the protection and enhancement of our environment; the need to fund our transportation system in an era of fiscal constraint; and the implementation of federally-mandated Management Systems.

Part Three, Regional Transportation Plan Summaries, summarizes of all thirteen regional transportation plans, since the regional planning process is among the major avenues for the implementation of transportation policy.

Accessing the Future was prepared by the Executive Office of Transportation and Construction's Bureau of Transportation Planning and Development, with assistance provided by the Boston Metropolitan Planning Organization's Central Transportation Planning Staff, Cambridge Systematics, Inc., Howard/Stein-Hudson Associates, and the Massachusetts Regional Planning Agencies. The Plan was developed with oversight provided by an Executive Steering Committee comprised of the following organizations:

Federal Highway Administration
Executive Office of Environmental Affairs
Massachusetts Highway Department
Massachusetts Bay Transportation Authority
Massachusetts Port Authority

Federal Transit Administration
Executive Office of Economic Affairs
Governor's Highway Safety Bureau
Massachusetts Aeronautics Commission
Massachusetts Turnpike Authority

Massachusetts Association of Regional Planning Agencies
Massachusetts Association of Regional Transit Authorities

Accessing the Future

Part One: Advancing the Mission

Chapter 1: The Mission of Our Transportation System

Chapter 2: Policies, Goals, and Objectives

CHAPTER 1

THE MISSION OF OUR TRANSPORTATION SYSTEM

A GLIMPSE OF THE FUTURE

It's 7:30 AM on a Friday morning in the year 2020. Four carpoolers leaving from Methuen for their jobs in Downtown Boston save time by traveling in the High Occupancy Vehicle lane from the New Hampshire border to the Central Artery. In the afternoon the traffic flow will be reversed to accommodate northbound high occupancy vehicles. The carpoolers will be home in time to have dinner with their children.

A trucker traveling west-bound on the Turnpike with a load of building materials is headed for the Worcester exit at the interchange with Routes 146 and 20 in Millbury. She remembers the extra time involved in reaching Worcester before this interchange opened. Later in the day she will follow Interstate 495 onto the new Route 44 exit into Plymouth and realize a significant time savings by not having to travel into Boston and then south on the Southeast Expressway.

At noon, a group of New Bedford grammar school students arrive at North Station via Commuter Rail direct from New Bedford to attend the Circus at the Fleet Center. After the show, the children get back on board commuter rail for the trip home, arriving before dark.

It's 5:30 PM, and passengers from Washington, D.C. have just disembarked at Logan Airport's reconstructed Terminal A. Two business partners returning from meetings in the Capitol are heading home. To reach his home on the South Shore one partner has decided to take the ferry directly from Terminal A to the Ferry Terminal in Hingham. The other has opted for the shuttle bus to South Station via the Ted Williams Tunnel where a high-speed train will take her to the Worcester Intermodal Transportation Center at Union Station.

Outside South Station bicyclists, joggers, and walkers move briskly along the tree-lined boulevards and park land above the underground Central Artery. The October air is crisp and clean. A pedestrian pauses to admire a cardinal in a nearby tree. While still in the heart of a major metropolitan area, it is quiet enough to hear the bird sing. Meanwhile, 100 feet below, a motorist headed to Albany has just received information from the ITS system installed throughout the underground Central Artery that I-90 is trouble-free to the New York border.

The future we envision for our transportation system begins with planning today. This document *Accessing the Future, The Intermodal Transportation Plan for the Commonwealth of Massachusetts*, outlines the policies that will transform this glimpse of the future into reality. It presents a vision of our transportation future that is rooted in the desire to sustain and enhance our ability to travel safely, conveniently, and efficiently. The Massachusetts transportation system is more than a network of streets, sidewalks, bikeways, highways, transit lines, airports, railroads, and shipping lanes; every facet of our lives is dependent on our ability to move people and goods.

GUIDING PRINCIPLES

As we craft a vision for Massachusetts in the next century, it is clear that transportation is only one component of a broader vision. To the greatest extent possible, this vision should be compatible with the legacy bequeathed to us by the Founders of our Nation: that the protection of freedom is the first and most important role of government. Therefore, we believe that the following three basic components of personal freedom should serve as guiding principles for the development of transportation policy:

1. The citizens of the Commonwealth have a right to mobility — we must continue to provide and enhance access to goods, services, jobs, and social activities.
2. The citizens of the Commonwealth have a right to economic opportunity — we must continue to declare that the Commonwealth is open for business.
3. The citizens of the Commonwealth have a right to a high quality of life — we must preserve the cultural, historic, and scenic attributes that enrich our lives and attract visitors from around the world.

Accessing the Future embraces these three guiding principles. These are the principles from which we have fashioned our way of life: nowhere on Earth at any time in history have more people had more freedom, greater mobility, a higher standard of living, and better quality of life than in the United States today. The challenge facing us as we approach the 21st Century is to improve this mobility and foster our economic vitality as we protect our environment and quality of life.

TRANSPORTATION MISSION

As a first step in the process to develop transportation policies, the aforementioned guiding principles were used as a framework for the development of our transportation mission statement:

It is the mission of the transportation agencies and authorities of the Commonwealth of Massachusetts to plan, design, construct, maintain, and operate a safe, cost-effective, accessible, coordinated, and multimodal statewide transportation system that provides increased mobility for people and goods. The transportation system shall promote economic vitality, protect and enhance our environment, and be developed through the use of an open and cooperative public process.

Our Commitment to Personal Freedom Through Increased Mobility

In 1991 the Intermodal Surface Transportation Efficiency Act (ISTEA) codified changes in transportation planning designed to maximize mobility for people and goods. Implicit in the term "Intermodal" in the Act's title is the idea that improved connectivity and coordination

between modes increases mobility by encouraging multimodal trips — single trips in which more than one mode is used. Implementing the requirements of ISTEA in an era of limited financial resources demands that we examine carefully any improvements to one mode in the context of how these improvements relate to other modes. We must now connect highways with mass transit, and link these modes with rail lines, bus stations, ports, and airports. We must make all these facilities bicycle and pedestrian friendly. We must be committed to increasing mobility not only for vehicles but for people and goods. To accomplish this goal, our transportation system must be truly coordinated and multimodal.

As we strive for a coordinated, multimodal system, we must ensure that mobility is available to all, regardless of personal physical limitations or economic status, so that everyone has access to goods, services, jobs, and social activities. The Americans with Disabilities Act (ADA) reinforces the goal of providing a transportation system that is reliable and accessible to all potential users, including people with disabilities, by providing modal choices, ease of use, and proximity to service. At the same time, our transportation system must be safe: the safety and convenience of system users are major components in the provision of mobility.

The development of a safe, accessible, and coordinated transportation system requires a significant investment of resources. It is incumbent upon those private and public organizations that plan, design, construct, maintain, and operate our transportation system to act as efficiently and cost-effectively as possible to ensure that scarce resources are optimized.

Our Commitment to Economic Vitality

Public investment in transportation infrastructure promotes economic vitality and increases productivity by making private capital investment more effective. The ability to move goods and provide services quickly and economically is an important competitive advantage that we must maintain and enhance. By investing wisely in our transportation infrastructure we can improve productivity, become more competitive, and increase the availability of good jobs. In a highly competitive global market our extensive transportation system positions us well to challenge other countries for value-added industries and the high-wage jobs they generate. Future investments must strategically target projects and strategies that will return the maximum economic dividends.

Competitiveness and productivity are vital prerequisites for economic growth. By aggressively upgrading our ports, waterways, airports, and rail facilities to create significant intermodal trade centers, Massachusetts businesses, working with state government, can expand their markets and grow both nationally and internationally.

As we expand exports, we must also continue our efforts to expand our tourist industry. Our historic and cultural attractions, as well as the beauty of our natural resources draw visitors to Massachusetts from this country and around the world. Increasing the number of visitors should be one of our goals. We must recognize that even minor improvements can greatly enhance existing attractions and facilities and make them more visitor-friendly.

Accessing the Future, along with *Choosing To Compete: the Statewide Strategy for Job Creation*, produced in 1993 by the Executive Office of Economic Affairs and the University of Massachusetts, are integral components of a comprehensive statewide strategy for job creation

and economic growth. Both documents stress the importance of maximizing our investments to achieve the greatest long-term economic benefits.

Our Commitment to Protect and Enhance the Environment

The development of natural resources has traditionally been one of the driving economic forces in the United States. Although these resources were often developed and utilized without regard to environmental impact, we can no longer afford that course of action without jeopardizing our future and that of our children. As a mature society of over 250 million people, we must recognize our responsibility to protect and enhance our environment so that our culture, our economy, and our way of life remain viable for future generations.

With the passage of the Clean Air Act Amendments of 1990, environmental concerns rose to an unprecedented level of importance in the transportation planning community. Today, conformity with clean air requirements is as important an objective as mobility, and Massachusetts is committed to attainment of National Ambient Air Quality Standards. The challenge for transportation planners and decision-makers is to reduce air pollution while expanding travel choices and enhancing mobility for the traveling public.

While compliance with clean air requirements represents a significant challenge, it is only one part of a holistic environmental policy that also includes the protection and restoration of our water resources. In particular, the importance of protecting watersheds has reshaped regional thinking. The movement of surface and underground waters is not affected by political boundaries and jurisdictions: pollution generated in one community can spread to the wells of another. In more recent years, the scope of environmental concerns has expanded even further to include the preservation of open space as well our scenic, historic, and cultural resources. We must recognize and consider the importance of these issues in the development and implementation of our transportation system.

This aggressive and ambitious environmental focus must guide our thinking as we maintain and improve our transportation system. We must not, however, lose sight of the relevance of the environment to our general health and well being, nor of its potential to offer significant economic advantage. The question often asked is whether this ambitious environmental agenda is compatible with robust economic growth. The answer is yes! Our environment is one of the greatest competitive advantages we have.

Our Commitment to an Open and Cooperative Public Process

The Massachusetts transportation system is the product of an open and cooperative planning process that provides many opportunities for public participation. Members of the public — individuals, community associations, interest groups, businesses, and others — are our transportation customers. The intended outcome of the public participation process is informed and involved citizens who have access to public records and to the decision-making process.

Providing opportunities for public participation means more than just distributing materials and having meetings. It means developing innovative approaches to reach those traditionally underserved by existing transportation systems; it means providing complete information, timely

public notice, and full public access to key decisions; it means including public agencies, employee representatives, and private and public transportation service providers in the process; and it means conducting periodic reviews of the effectiveness of the public participation process itself.

TRANSPORTATION POLICIES

Accessing the Future is more than a philosophical statement; it is a challenge to undertake and achieve an ambitious mission. As a first step in the implementation of this mission, policies, goals, and objectives must be established. The seven policies shown on Table 1-1 are the result of a year-long public process which aimed to synthesize the policies of all Commonwealth transportation agencies, Regional Planning Agencies, Regional Transit Authorities, as well as the transportation-related policies of other Commonwealth agencies. In turn, these seven policies are the basis for the establishment of the goals and objectives discussed in the next chapter of *Accessing the Future*.

Table 1-1

COMMONWEALTH OF MASSACHUSETTS TRANSPORTATION POLICIES

- I. The Massachusetts transportation system shall be the product of an integrated and cooperative planning process that provides extensive opportunities for public participation.
 - II. The Massachusetts transportation system represents an irreplaceable asset that shall be maintained by utilizing resources in the most efficient, effective, and safe manner.
 - III. The Massachusetts transportation system shall provide increased mobility for people and goods in order to improve quality of life and provide economic advantages.
 - IV. The Massachusetts transportation system shall be accessible to all people regardless of personal physical limitations or economic status.
 - V. The Massachusetts transportation system shall serve as an engine that enhances the Commonwealth's competitive advantage, promotes economic development, and maximizes employment opportunities.
 - VI. The Massachusetts transportation system shall foster a sustainable society, one in which economic growth and environmental protection work in tandem, residents' quality of life is maintained, and the historic and scenic values that attract visitors to the Commonwealth are preserved.
 - VII. The Massachusetts transportation system shall be planned, implemented, and operated in the most cost-effective and efficient manner, and innovative financing strategies shall be utilized to the maximum extent.
-

CURRENT INITIATIVES

The policies outlined in Table 1-1 are not new: in a sense they are the culmination of many years of policy formulation, synthesis, and negotiation. Even though they may have not been explicitly stated before the development of *Accessing the Future*, these policies have implicitly served to guide the development of projects and strategies that are currently being implemented or are now in the planning stage. The following current initiatives are all major components in the implementation of the Commonwealth's transportation policies, moving us toward the vision of our transportation future.

Central Artery/Ted Williams Tunnel

The Central Artery/Ted Williams Tunnel Project is the largest public works project in the history of the United States and the final link in our Nation's interstate highway system. This massive project will dominate the transportation agenda of Massachusetts into the next century. When the project is completed, the six-lane elevated section of I-93 traversing downtown Boston will be replaced with a new eight to ten lane underground roadway, and the Massachusetts Turnpike will be extended to Logan Airport via a four lane tunnel below Boston Harbor.

This project will bring to the metropolitan Boston area a modern, efficient, and state-of-the-art highway system. The Central Artery/Ted Williams Tunnel project will provide vital intermodal connections between the busiest port, airport, and transit system in New England. Pedestrians and bicyclist will access the broad, tree-lined boulevards and the hundreds of acres of park land that will be created by the demolition of the infamous "green monster." Forecasts suggest that the enhanced mobility resulting from this project will increase economic productivity through reductions in travel delays.

North Station/South Station Rail Link

Building the North Station/South Station Rail Link will offer new transportation options by making the overall metropolitan highway and public transportation system more interconnected, efficient, and accessible. The Rail Link will serve as the most far-reaching element of a regional transit system connecting suburban park-and-ride commuter rail stations to the subway/streetcar rapid transit network, city and regional bus services, and Logan International Airport. The Rail Link will be crucial additional component in Massachusetts' air pollution mitigation strategies by maximizing intercity and regional rail ridership to the north, south, and west of Boston helping reduce congestion on our highways.

The Rail Link, along with regional rail system electrification, will also prove to be a meaningful and significant action to address the energy realities facing the world today. We are now in the late era of petroleum-based economies. Global oil reserves are expected to be depleted in the coming decades. During the first half of the 21st Century, energy users worldwide will be forced to rely increasingly on electric power sources. The intercity and regional rail electrification proposed as part of the Rail Link project will no doubt be viewed by future generations as simple economic sense.

Ultimately, completion of the Rail Link will unite North Station and South Station into one system providing convenient and efficient service for AMTRAK intercity trains as well as for the rapidly growing regional rail services for Eastern Massachusetts. With the Rail Link, AMTRAK

will be able to run through service connecting cities north and south of Boston without transfers. Concurrently, the MBTA will be able to develop and operate seven through-routed regional services linking communities on the northside of metropolitan Boston with their southside counterparts.

Intelligent Transportation Systems

Management of transportation systems in the future will incorporate the use of advanced computers, electronics, and communications to integrate activities for the entire surface transportation system. These intelligent transportation systems (ITS) will utilize a full range of technologies to develop a truly intermodal system that offers user services in the areas of travel planning, traveler information, travel management, travel payment, commercial vehicle operations, emergency management, and advanced vehicle control.

Strategies for near-term and long-range deployment of ITS elements in the Metropolitan Boston region were developed and presented as part of an early deployment study completed in January 1993. Similar planning activities are beginning which will lead toward the development of a statewide ITS strategic deployment plan. Further ITS strategic planning activities include active participation in the I-95 Corridor Coalition and ITS America, a nationwide organization devoted to the advancement of ITS activities.

State transportation agencies also continue to move toward the integration of these advanced technologies throughout the transportation system. Examples of this integration include the following:

- The planning and design of surveillance, detector, monitoring, control and emergency systems for the Central Artery/Ted Williams Tunnel.
- Multi-agency cooperation for the development of electronic toll collection and toll management systems.
- The continued testing of advanced traveler information systems (ATIS) to provide real-time information for pre-trip and enroute user services.
- Deployment of dedicated fiber-optic communications networks throughout the state.

High Speed Rail and Commuter Rail Extensions

Electrification of the Northeast Corridor is underway and will reduce rail travel time to New York City to three hours. AMTRAK is also making plans to extend rail service to Portland Maine. Fast and affordable train service will preclude the need for major new airport facilities in Massachusetts.

The Old Colony Commuter Rail Restoration project, the largest public transportation project in the region, is also underway and will provide South Shore commuters with an additional alternative to the Southeast Expressway. The Middleborough, Plymouth, and Greenbush Lines will restore service to 23 cities and towns.

In addition to the Old Colony project, commuter rail has also been extended from Framingham to the city of Worcester. Currently, the MBTA is acting to locate and construct new stations along the Worcester line in Ashland, Southborough, Westborough, Grafton, and Millbury. Also, design has begun on extending commuter rail service to Newburyport, and a

funding source has been dedicated to the design and construction of commuter rail service into both Fall River and New Bedford.

Intermodal Centers

Intermodal centers are currently being planned for Ayer (Fort Devens), Boston (South Station), Brockton, Hyannis, Pittsfield, Springfield, and Worcester. The success of these intermodal centers will be dependent on our ability to facilitate the mobility of all intermodal transfer system users by minimizing the distances and grade changed at intermodal transportation facilities.

High Occupancy Vehicle Lanes

High Occupancy Vehicle (HOV) lanes will be constructed on most of the radial highways in metropolitan areas as part of an ongoing effort to improve mobility and clean our air. Using movable barrier technology, a contraflow HOV lane will be added to the Southeast Expressway on an interim basis; eventually the movable barriers will be replaced by a dedicated reversible flow HOV lane. Also, the recent extension of the I-93 HOV lane north of the Central Artery will be extended to the New Hampshire border, and planning has begun in an effort to construct HOV facilities along Interstate 95 and Route 24.

Park-and-Ride Facilities

In an effort to reduce the number of single occupant vehicles (SOV) and promote carpooling and transit options 20,000 new park-and-ride spaces are being developed across the Commonwealth. When completed there will be over 60,000 park-and-ride spaces aimed at reducing congestion and improving our air quality.

Bicycle Projects

Projects and programs designed to promote bicycling and walking will focus on safe travel on existing streets as well as the development of off-street multi-use trails. Off street facilities include: Cape Cod and Islands Projects, Minuteman Commuter Bikeway and the Norwottuck Rail Trail. In 1994 the Massachusetts Highway Department issued a comprehensive manual entitled "Building Better Bicycling." The manual provides engineering guidance based on AASHTO and FHWA publications. It also provides program information on education, enforcement and encouragement issues.

Route 146 Interchange (Worcester)

The Route 146/Massachusetts Turnpike Interchange Project is a major regional highway construction project that will provide much needed improved highway access to Worcester and the Blackstone Valley region of Central Massachusetts. The project, which also includes local roadway improvements, will create improved intermodal connections resulting in a safer, more efficient highway system that will stimulate economic development and job creation throughout the Worcester/Millbury area.

The project will improve more than four miles of Route 146 from Route 122A in Millbury to Interstate 290 in Worcester by widening the existing two lane unlimited access roadway to a four lane limited access facility. Other improvements are also included: a segment of Route 20 will be reconstructed and upgraded; a new interchange between the Turnpike, Route 146, and Route

20 will be constructed; safety and capacity improvements will be built on Route 146 at Route 122A and I-290; and, grade separations will be constructed between local streets and Route 146 at Hurley and Kane Squares in Worcester.

North Shore Transit Improvements

The MBTA has begun to assemble information regarding public transportation infrastructure and services to the North Shore. Coupled with a commitment to extend commuter rail to Newburyport, the MBTA is looking at a variety of ways to improve public transportation in the North Shore area while promoting economic growth and maximizing environmental benefits. This will be accomplished by discussing the issues and alternatives with the North Shore public to assure that the resulting improvements serve not only Boston commuters but also local North Shore transportation needs.

Water Transportation

The Massachusetts Water Transportation Task Force has been formed to conduct a complete survey of current water transportation activities in the Commonwealth. The Task Force will identify potential water transportation links, research new water transportation technology, and produce a comprehensive action plan. The potential benefits of an enhanced Commonwealth water transportation system are plentiful. New or planned commuter boat terminals at Rowe's Wharf, the new South Boston Federal courthouse, and Logan Airport are truly intermodal, providing still another intermodal choice for travelers. In addition, potential implementation of water shuttle services in many communities, including Newburyport and Scituate, will help reduce congestion and improve air quality.

Berkshire County North/South Connector

After years of spirited debate, a consensus has been forged in Berkshire County to improve the county's infrastructure and foster economic growth. The Massachusetts Highway Department has been directed to initiate a Major Investment Study to evaluate the construction of a north/south connector road from the Massachusetts Turnpike to North Adams. The Commonwealth is committed to this project and will work diligently to develop a route which will promote economic growth with a little adverse environmental impact as possible. As part of the project a new road may that carries traffic from Dan Fox Drive into Pittsfield, Route 7 may be widened, and a new toll-free interchange may be constructed at Route 7 and the Turnpike in Sturbridge.

Logan 2000

Massport is embarking on a major reconstruction of airport facilities to improve passenger access and mobility. Existing terminals and support facilities are over 25 years old and require major upgrading or replacement. Transit access will be improved by a new people mover system which will link the terminals to each other and to the Airport MBTA station. In addition, the Ted Williams Tunnel entrance and approach roadways are being constructed through the airport with the promise of improved access to and from the airport as well as improved ground transportation throughout the airport. The confluence of these factors has furnished the challenge and the opportunity to reinvent Logan International Airport as an intermodal transportation center for the 21st Century.

Route 3 and Route 128 Transportation Improvement Projects

Prudent investments in highway projects that increase capacity are warranted when other alternatives are unable to solve congestion and air quality problems. Alternatives are being studied for ways to add-a-lane on both Route 3 and Route 128 in each direction. It is yet to be decided is whether the new lanes will be general purpose lanes or for HOV use.

Route 44 (Plymouth)

One of the biggest transportation challenges facing southeastern Massachusetts is the difficulty of east-west travel. Route 44 is the major east-west arterial in the region, and planned improvements will assure greater access to southeastern Massachusetts. Route 44 (between Route 3 and Route 495) will be replaced with a divided highway which will intersect Route 3 at a location slightly north of the current location where a new interchange is currently under construction.

MOVING FORWARD

The sound investments made in our transportation system today will pay dividends decades from now. The projects and strategies currently underway, in concert with the policies presented in Table 1-1, and detailed in Chapter Two, point us in the direction of such investments, but they are only a beginning. We must also ensure that the goals and objectives derived from these policies are accomplished: over the next few years we must "keep score" of how well we are progressing. In policy areas where goals and objectives are less well-defined, we must work together to articulate them more clearly. We must ensure that the projects and strategies derived from these policies are developed cooperatively by the Commonwealth and the regional agencies with regular public input as they proceed through the planning process.

As we move to strengthen the planning process we must also consider the benefits of restructuring our state transportation agencies into a cohesive, responsive, and integrated Department of Transportation (DOT). Policy, planning, and funding decisions originating from a single source at the state level, and implemented consistently by state transportation agencies and authorities, should offer greater opportunities to achieve our intermodal vision of the future. In tandem with moving towards a DOT structure, we must keep in mind that every initiative in this Plan will ultimately compete for funds in a fiscally-constrained environment. A strong DOT, well informed through its commitment to the public participation process, can and will be prepared to make tough decisions and to prioritize the implementation of programs and projects in the future.

Accessing the Future represents a new direction with new priorities for state and local government in the transportation field. If we work together, stay true to our principles and focused on our mission, we can achieve our vision of the future through the implementation of the ambitious policies, goals and objectives outlined in this Plan. The transportation legacy we leave to our grandchildren is on the drawing board today. While the task may seem daunting and the resources limited, we need only remember the transportation system our grandparents grew up with and contemplate the great advancements they made.

CHAPTER 2

POLICIES, GOALS, AND OBJECTIVES

This chapter presents the goals and objectives derived from the transportation policy statements described in Chapter One. These goals and objectives will guide all transportation planning and implementation activities to ensure that those policies are implemented and our ultimate mission is achieved.

Each of the seven sections of this chapter begins with a statement of one of the transportation policies, which is followed by specific goals (denoted by capital letters A, B, C, etc.) that need to be accomplished to implement the policy. After each goal, numbered objectives are listed which serve to refine and focus each goal.

The policies, goals, and objectives contained in this Chapter will provide the framework for the development of future transportation plans, improvement programs, and planning studies. They will also guide the actions and strategies of all those responsible for transportation system planning, design, construction, operation, and maintenance.

I. INTEGRATED AND COOPERATIVE PLANNING PROCESS

The Massachusetts transportation system shall be the product of an integrated and cooperative planning process that provides extensive opportunities for public participation.

A. Develop a proactive, extensive, inclusive, and ongoing public participation process.

1. Maximize public involvement in the metropolitan planning process by encouraging the participation of private citizens, local government representatives, business representatives, transportation providers, transportation employee representatives, interest groups, and others on regional planning commissions, regional transit commissions/boards, regional transportation advisory groups, and regional project, corridor, or issue-specific advisory committees.
2. Maximize public involvement in statewide transportation planning efforts through the use of issue-specific statewide advisory councils such as the Massachusetts Bicycle Advisory Board, the Massachusetts Freight Advisory Council, and the Massachusetts Pedestrian Advisory Board. Additional statewide advisory groups may relate to issues such as intercity transportation, accessibility to transportation services by people with disabilities, and the relationship between transportation and the environment.
3. Foster private sector involvement in the planning process through the continued exchange of information between businesses and public-sector agencies in order to ensure compatible, efficient, and cost-effective planning and resource allocation.
4. Expand participation by those traditionally under-represented in the planning process, such as the people with disabilities, the economically disadvantaged, Indian Tribal Governments, and others, to ensure full representation in the development of transportation policies, plans, and programs.
5. Encourage the use of innovative methods to increase public participation in all components of the transportation planning process.
6. Periodically assess the effectiveness of the statewide and metropolitan public involvement processes to ensure that they provide the public with access to the planning process, and that timely revisions of the process are made as a result of that public input.

B. Develop and implement transportation policies and plans cooperatively between state agencies and the regional planning and transit agencies through the Metropolitan Planning Organization (MPO) process.

1. Continue State presence and participation at regional planning commission meetings, transportation advisory group meetings, and on regional project, corridor, or issue-specific advisory committees.

2. Expand State cooperation, as appropriate, with the activities of the Massachusetts Association of Regional Planning Agencies and the Massachusetts Association of Regional Transit Authorities.
3. Integrate the cooperatively-developed ISTEA Management Systems into the statewide and metropolitan planning processes.

C. Ensure coordination and cooperation between state agencies regarding the development and implementation of transportation policies, plans, and programs.

1. Create and maintain an ongoing process for collecting, using, and sharing information between and among all agencies involved in the development and implementation of transportation policies, plans, programs, and decisions.
2. Develop and employ appropriate mechanisms to address and resolve conflicts, mitigate transportation and/or development impacts, and assimilate divergent opinions in a responsive and inclusionary manner.
3. Update this Statewide Intermodal Transportation Plan at least every five years.

D. Foster coordination and cooperation among states to enhance interstate transportation system efficiency, and to avoid and mitigate any adverse effects of intrastate transportation decisions on neighboring states.

1. Continue to support and participate in interstate programs such as the New England Transportation Initiative, the I-95 Corridor Coalition, the New England Governors Council, the New England Transportation Consortium, and the Coalition of Northeast Governors.
2. Ensure that transportation planning and programming decisions are coordinated among the states in interstate Transportation Management Areas.
3. Develop mechanisms, as appropriate, to ensure that plans, initiatives, or current developments in one state are shared with neighboring and/or impacted states and encourage reciprocity between states.

II. INFRASTRUCTURE PRESERVATION AND SYSTEM SAFETY

The Massachusetts transportation system represents an irreplaceable asset that shall be maintained by utilizing resources in the most efficient, effective, and safe manner. Safety shall be a primary consideration in the design, development, and operation of the Massachusetts' transportation system.

A. Implement the asset-based ISTEA-mandated management systems to assist decision-makers in selecting cost-effective strategies to protect investments in infrastructure.

1. Coordinate the development of the ISTEA-mandated management systems to ensure compliance with federal guidelines. Continue the present organizational approach which includes an interagency Management Systems Executive Steering Committee to ensure that adequate resources are available for system implementation, and that target dates are met; and the Management Systems Technical Coordinating Committee to ensure the use of common or coordinated reference systems and methods for data sharing.
2. Continue implementation of the Bridge Management System, inspect and rate all highway bridges to ensure proper posting and rating, and train all bridge and operation personnel in bridge inspection and construction techniques.
3. Continue implementation of the Pavement Management System to inspect and rate all state highways to ensure current information and techniques are used to develop cost-effective rehabilitation strategies.
4. Implement the Public Transportation Facilities Management System, conduct an inventory and assessment of the condition of major transit assets, develop performance standards using life cycle costing, and prioritize maintenance strategies.
5. Coordinate implementation of the asset-based management systems (Objectives 2, 3, and 4, above) with implementation of the performance-based management systems — Congestion, Intermodal, and Safety.

B. Reduce construction, maintenance, and operation costs through improved design, material selection and performance, and construction techniques.

1. Update design standards to reflect current technology, materials, and techniques, and incorporate design features which permit easier maintenance.
2. Coordinate design reviews with maintenance and construction personnel, and emphasize quality assurance during construction.
3. Develop system standards for facility performance and maintenance and incorporate them into design procedures.

4. Facilitate joint procurement by developing common specifications, and create a system for the sharing/exchange of spare parts; review the status of warranted items before the warrantee expires.
5. Initiate technical training courses for all maintenance staff that emphasizes solutions to common maintenance problems.
6. Review design standards to ensure reasonableness given the intended project use in order to prevent project overdesign and concomitant additional costs.

C. Ensure that safety requirements are considered in the planning, design, construction, and operation of transportation system facilities.

1. Ensure that facility designers are aware of construction safety issues, and are knowledgeable about the special safety needs of particular system users, such as persons with disabilities, pedestrians, bicyclists, truckers, and others.
2. Provide safety training to field personnel through the use of safety briefings and annual traffic management updates.
3. Conduct ongoing safety inspections of transportation facilities, including construction zones, and establish central coordination of timing of concurrent construction projects
4. Conduct safety evaluations of new technology and techniques, such as Intelligent Transportation Systems.
5. Work with federal agencies to develop alternative design guidelines that meet safety standards but are compatible with and preserve the character of rural and historic communities.
6. Ensure highway system safety by implementing the ISTEA-mandated Massachusetts Highway Safety Management System, which includes re-engineering the Massachusetts Highway Department (MHD) Accident Record System; coordinating with the Registry of Motor Vehicles on redesigning the Massachusetts Accident Report; developing management support systems for traffic control devices; developing clear safety goals for highway projects; ensuring that safety benefits are factored into the MHD project selection process; and evaluating project safety after implementation.

D. Provide education and training to increase public awareness of transportation safety issues.

1. Coordinate safety outreach among transportation providers, other government agencies, and transportation user groups.
2. Establish a public awareness program for highway safety, particularly as related to construction zones, traffic control devices, accident report preparation, highway/railway grade crossings, and rules of the road for bicyclists and pedestrians.

E. Enhance transit safety and security and improve cooperation between transportation and enforcement agencies.

1. Incorporate current technology into security systems and develop incident monitoring procedures to identify recurring problems, including trespassing and vandalism.
2. Include enforcement agencies in the design review process for transportation facilities.
3. Improve communication between transportation-related enforcement agencies and local enforcement agencies.
4. Promote increased presence of transit and local enforcement officials on transit systems.
5. Promote increased safety training opportunities for public transportation operators.

F. Provide increased safety in the movement of Hazardous Materials (HAZMAT).

1. Develop a HAZMAT permitting process to ensure that HAZMAT routes and schedules are based on chemical hazard risk analyses, and that care is taken to avoid residential route and watershed areas.
2. Design transportation projects with due consideration of HAZMAT spill contingencies in order to mitigate future adverse impacts.
3. Develop a spill response policy and train appropriate emergency response agencies.
4. Ensure that the routing and designation of HAZMAT corridors allow full intermodal access to maritime facilities to promote the flexibility of waterborne transport.
5. Develop and implement a port information system and vessel traffic system capable of providing appropriate routing and safety for vessels transporting HAZMAT cargoes.

G. Plan, promote, and provide safe travel for bicyclists and pedestrians, in a manner appropriate for each group, recognizing that bicycling and walking have distinct operational characteristics and safety requirements.

1. Incorporate bicycle and pedestrian safety considerations in the design, construction, and maintenance of transportation facilities, such as roadways, bridges, transit facilities, etc.
2. Implement a bicycle and pedestrian spot safety program to provide low-cost, small-scale improvements such as railroad crossing repair, drainage grate replacement, sidewalk repair, obstruction removal, and curb cuts.
3. Develop and implement training and technology transfer programs to promote safer bicycling through federal training sessions on comprehensive bicycle safety programs;

training programs for local, regional and state personnel on bicycling safety design and operation; the BayState Roads Program; and other appropriate mechanisms.

H. Maintain the safety and security of air travelers, and maintain clear airspace at public use airports.

1. Develop, maintain, and enforce comprehensive statewide safety guidelines for public use airports by thoroughly reviewing and updating Commonwealth of Massachusetts Aeronautical Regulations, developing minimum standards for airport safety regulations and aeronautical operations conducted at public-use airports.
2. Adopt new safety technologies where appropriate, such as the modernization of air traffic control systems; the installation of Global Positioning System (GPS) navigational aids, automated weather observation systems, and new and expanded sign, lighting, and sensor devices; and promotion and development of Category I and Category II GPS technology.
3. Maintain clear airspace at public use airports by removing vegetation that obstructs airspace protected by federal or state regulations and develop a comprehensive Vegetation Management Plan for each public use airport.

III. MOBILITY FOR SYSTEM USERS

The Massachusetts transportation system shall provide increased mobility for people and goods in order to improve quality of life and provide economic advantages. Improvements may be derived by fostering intermodal connections, encouraging the use of advanced technology, optimizing the operation of existing systems, reducing the demand for travel, encouraging the use of alternative modes, and by providing prudent system capacity increases.

A. Expand mobility by ensuring full and formal consideration of intermodal connections in transportation policy formulation, planning, design, and funding at all levels.

1. Formalize the planning and evaluation of intermodal needs and performance as a discrete activity integrated within the transportation planning process at the state and regional level. This can be fostered through the implementation of the ISTEA Management Systems, particularly the Intermodal Management System and the Congestion Management System.
2. Design intermodal transportation programs and prioritize transportation investments to be supportive of commerce and economic development.
3. Assure the greatest possible physical integration of intermodal connections by coordinating the planning and design of transportation services and facilities for different modes in order to create natural opportunities for mode transfer points within transportation corridors.
4. Assure the greatest feasible operational integration of intermodal connections by coordinating schedules within modes and among service providers, and by encouraging service vendors to coordinate hours and days of service to more completely accommodate mode transfer travel requirements.
5. Assure the greatest feasible institutional integration of intermodal connections by coordinating schedules, fares, transfer availability, transfer cost, etc., among all modes, including services and facilities provided by both the public and private sectors.
6. Facilitate the mobility of all intermodal transfer system users by minimizing distances and grade changes at intermodal transportation facilities, particularly for those facilities heavily used by persons with carry-on bags, families with children/strollers, the elderly, and people with disabilities, and by providing complete schedules, routes and fare information at modal interchange points.
7. Select locations for transportation terminals, transportation centers, and parking sites that can accommodate multiple modes and facilitate mode transfers while protecting the quality of life in communities and neighborhoods where facilities are located.

B. Encourage the application of advanced technologies where measurable gains may be realized to improve safety, reduce congestion, increase mobility, reduce adverse environmental impacts, improve energy efficiency, and improve cost-effectiveness.

1. Establish an interagency advanced transportation technology advisory committee, under the auspices of the Executive Office of Transportation and Construction, to coordinate activities related to the application of advanced technology in the Commonwealth's transportation systems.
2. Develop a statewide strategic plan for the integration of advanced technologies including Intelligent Transportation Systems (ITS), into the Commonwealth's transportation system and in the planning of transportation improvements.
3. Educate, advise, and inform transportation professionals regarding the benefits of incorporating advanced technologies into solutions to transportation problems by establishing educational, informational, and training programs.
4. Actively participate in the development of advanced technologies for transportation planning through regional and national forums such as ITS America, the I-95 Corridor Coalition, and other organizations.
5. Encourage advanced technology applications and system integration through the development of public/private partnering arrangements.
6. Identify and aggressively pursue options for the deployment of demonstration projects and operational tests as prototypes for the application of advanced technologies.
7. Establish standards to foster interagency compatibility and improve effectiveness by eliminating duplicate, redundant, or competing systems.

C. Implement Transportation System Management strategies to increase mobility by optimizing the operation of existing transportation systems.

1. Manage highway traffic congestion by utilizing freeway surveillance and control systems, incident management, ramp metering, and other advanced ITS technology through the implementation of the Metropolitan Boston ITS Strategic Deployment Plan, other regional/local ITS plans, and the Statewide ITS Strategic Plan.
2. Plan and implement various High Occupancy Vehicle (HOV) projects, and develop an HOV System Plan.

3. Proceed, through the multi-agency Traffic Management Team, with a more comprehensive, proactive form of incident management by expanding the Statewide Incident Response program, continuing the Motorist Assistance Program, and by expanding the current I-93 Incident Response Van Pilot Project across the Commonwealth.
4. Improve arterial traffic flow through the use of access management, channelization, signal timing, integrated traffic management systems, and parking restrictions and enforcement.
5. Continue Advanced Traveler Information Systems (ATIS) demonstration projects, and conduct evaluations of their effectiveness.
6. Utilize low-capital-intensive transit strategies such as advanced public transportation technology, priority bus lanes, traffic signal preemption, express service, timed transfer strategies, rail signal system improvement, etc., to improve transit system performance and encourage modal shifts.
7. Increase the availability of park-and-ride spaces to facilitate mode transfers from private vehicles to HOV, bus, and commuter rail services.
8. Plan and implement improved transit services to serve low density suburban and rural areas, and encourage the utilization of residential and commercial site-specific design treatments.

D. Reduce demands placed on highway facilities by encouraging the use of Transportation Demand Management (TDM), increasing the use of alternative modes, and by providing substitutes for travel.

1. Promote area-wide ridesharing initiatives and provide incentives for commuters to share rides in carpools or vanpools.
2. Promote employer-based transportation management programs that assist employees in making commute and travel choices by offering assistance to employers in developing innovative solutions to transportation needs, such as shuttle services, guaranteed ride home programs, and transportation allowances.
3. Assist the business community to organize, initiate, and operate private Transportation Management Associations (TMAs) and transportation centers, and improve the marketing of available transportation services at employment centers to encourage the use of non-auto modes.
4. Encourage the implementation of employer subsidized transit pass programs as provided through the National Energy Conservation Act of 1992 and fund marketing programs.

5. Encourage work schedule and location changes to reduce commute travel or shift it to off-peak periods, such as flexible work hours, compressed work weeks, staggered work hours, and telecommuting.
6. Develop parking management strategies such as preferential parking programs for HOVs, modified parking fee structures, and bicycle parking facilities to encourage shifts to alternative modes.
7. Involve the MBTA and the Regional Transit Authorities in the planning and implementation of targeted and area-wide TDM programs.
8. Incorporate transportation demand management strategies into the permitting and MEPA process, including the use of Section 61 findings, and monitor the implementation of TDM commitments.

E. Plan and implement prudent system capacity increases to alleviate congestion, provided that all appropriate alternatives are evaluated and are the product of an approved Congestion Management System (CMS).

1. Implement ISTEA-required regional Congestion Management Systems that meet federal requirements within the required time frame.
2. Develop criteria and guidelines for the conduct Major Investment Studies and Corridor Studies.
3. Develop and implement policies and procedures to allow the preservation of the rights-of-way of corridors that may have current or future transportation uses, and initiate a cooperative and systematic process to identify those corridors for which action is needed; explore the use of innovative corridor preservation tools such as exactions, access management, development ordinances, options to purchase, and the transfer or purchase of development rights.

F. Provide bicycle and pedestrian facilities and encourage bicycle and pedestrian travel as viable transportation modes.

1. Adopt a Statewide Bicycle Policy to support and promote the safe use of bicycles in the Commonwealth, and develop a Statewide Bicycle System Plan through a process that includes an inclusionary public participation process and that utilizes regional bicycle plans.
2. Adopt a Statewide Pedestrian Policy to support and promote safe walking in the Commonwealth, and develop a Statewide Pedestrian System Plan through a process that includes an inclusionary public participation process and that utilizes regional pedestrian plans.
3. Make bicycle and pedestrian facilities an integral part of the highway system by designing, constructing, reconstructing and maintaining roadways and bridges to safely accommodate bicyclists and pedestrians.

4. Revise the Massachusetts Highway Design Manual, and other applicable state, regional, and local design and operation manuals to more fully incorporate state-of-the-practice bicycling and pedestrian elements.
5. Develop a comprehensive and coordinated off-highway system of bicycle and pedestrian facilities by designing, constructing, reconstructing, and maintaining paths and multi-use off-road trails, such as rail-trails and trails on utility rights-of-way, and by protecting the integrity of abandoned railroad rights-of-way for potential reuse.
6. Provide bicyclist and pedestrian access to and within park-and-ride facilities and passenger rail, bus, ferry, and air terminals, and provide secure bicycle parking at these locations.
7. Provide safe and convenient bicycle conveyance aboard passenger railroads, buses, ferries, and airplanes.
8. Plan, provide, and promote safe travel by bicyclists and pedestrians through local, regional, and state land use policies, plans, and projects through utilization of the MEPA process in developing site plans and designs for such facilities as employment centers, shopping malls, schools, and residential developments. Incorporate bicycle and pedestrian access and safety through zoning, master plans, and other appropriate local, regional, and state mechanisms.

G. Improve intercity passenger rail and bus transportation.

1. Develop marketing initiatives to improve passenger awareness of inter-regional transportation choices, such as the production of an inter-regional map and related information detailing intermodal connections in Massachusetts and adjoining states.
2. Coordinate services provided by public and private transportation operators within Massachusetts and in adjoining states and develop a statewide system of passenger intermodal transportation centers.
3. Support high-speed passenger service in the Northeast Corridor, and investigate the appropriate role for high-speed ground transportation in other Massachusetts corridors, such as Pittsfield-Springfield-Boston.
4. Coordinate the electrification of passenger rail rights-of-way and the development of high-speed rail rights-of-way with existing and future freight operations to ensure that infrastructure projects for passenger or freight do not preclude future improvements for one another.
5. Update the passenger rail component of the 1989 State Rail Plan to reflect current conditions and imperatives.

H. Improve passenger aviation system performance.

1. Develop short- and long-range airport capital improvement plans that are the result of a determination of current and potential capacity and demand levels; direct expenditures to airports on the basis of economic impact, safety, environmental protection, and system preservation.
2. Seek to improve utilization of existing regional airports to serve existing regional demand and to offset future demand in excess of capacity at Logan International Airport.
3. Seek to reduce delays to air passengers through the use of improved air traffic control technology.
4. Develop programs to improve ground access to public use airports; continue implementation of Massport's Logan 2000 Program to restructure Logan Airport access and terminal facilities to accommodate future growth, as well as Massport's Intermodal Passenger Transfer System, a people-mover connecting the Airport MBTA Station with all airport terminals.

I. Improve and expand the Commonwealth's passenger water transportation system.

1. Implement the recommendations of the Boston Inner Harbor Water Transportation Study.
2. Conduct a comprehensive study of statewide water transportation needs and opportunities for service expansion and implementation, utilizing focus groups, and in cooperation with water transportation providers, consumers, business representatives, and community officials.
3. Utilize water transportation services to the maximum feasible extent to mitigate traffic congestion and to serve recreational demand.
4. Explore opportunities for inter-agency collaboration and innovative funding techniques in the development and implementation of water transportation services.
5. Foster economic development potential through the enhancement of water transportation service industries such as ship-building, boat repair and maintenance, etc.

J. Improve the efficiency of the freight system and improve urban and rural goods movement to reduce costs for users and to foster increased international trade.

1. Develop and implement the Intermodal Management System (IMS) to improve freight system performance. The IMS will systematize freight system data analysis, needs identification, and strategy identification and evaluation in order to provide a framework for decision makers to choose among competing projects and strategies.

2. Develop appropriate linkages between the IMS and other management systems to ensure that freight issues are considered; for example, the Bridge Management System should identify bridges with limited rail clearances so that prioritization can be given to developing potential double-stack routes.
3. Utilize the Massachusetts Freight Advisory Council so that freight transportation users and providers can participate in the identification of needs and have full access to the transportation planning and project implementation process.
4. Continue development of the Massachusetts Double-Stack Initiative to enhance seaport, motor carrier, and rail intermodal operations.
5. Continue to conduct special studies related to freight movement, such as those related to the capacity and expansion potential of current freight intermodal facilities (such as Ft. Devens Terminal and the Port of Worcester); and study the establishment of a dedicated priority route for international land bridge, mini-land bridge, and micro-land bridge freight routes.
6. Adopt the recommendations of the Governor's Commission on Commonwealth Port Development (October, 1994) to enhance Massachusetts seaport facilities.
7. Ensure that waterborne freight rights-of-way are maintained to provide access to seaport facilities and intermodal terminals by securing waterborne vessel access (including channel width, vertical clearance, dredging depths, and berthing locations) and by ensuring that infringement by shoreside improvements such as piers, bridges, electric power lines, etc., does not occur.
8. Protect existing and potential waterside facilities, including potential passenger terminal piers and commercial vessel berths, and access routes to these facilities such as rail spurs near marine terminals, landside transit access to water/taxi berths, etc.
9. Preserve potential access routes for construction of off-shore oil terminals, taking into account terminal location, pipeline routes, and access to existing storage facilities.

IV. TRANSPORTATION SYSTEM ACCESS

The Massachusetts transportation system shall be accessible to all people regardless of personal physical limitations or economic status. The Americans with Disabilities Act (ADA) provides comprehensive civil rights protections to individuals with disabilities in the areas of employment, public accommodations, state and local government services, and telecommunications.

- A. **Remove physical impediments to accessibility by renovating existing transportation vehicles and facilities, and by purchasing and building new vehicles and facilities that conform to accessibility standards.**
 - 1. Comply with the standards set by the Architectural and Transportation Barriers Compliance Board, the Massachusetts Architectural Access Board, and the Americans with Disabilities Act Accessibility Guidelines.
 - 2. Implement key station plans in a timely fashion. Key stations have been designated by transit authorities as those rail stations which qualify under criteria set under ADA.
 - 3. Improve access to facilities along state highways including sidewalks, rest areas, tourist information facilities, and parking facilities, and designate key highway corridors to promote physically-accessible travel within the Commonwealth and to neighboring states.
 - 4. Utilize transit vehicles that are accessible to people with disabilities by designing and purchasing only accessible vehicles, or, if it is more cost effective, by retrofitting existing vehicles.
- B. **Provide improved system access and increased opportunities to travel by operating transportation services in conformance to standards regarding affordability, geographical extent of service areas, operational characteristics, and provision of choices.**
 - 1. Market the availability of reduced transit fares, including those available through the use of the Statewide Access Pass.
 - 2. Implement ADA-required Complementary Paratransit Plans in order to provide complementary paratransit service along at least a 3/4 mile corridor around a fixed-route bus or radius around a rail station; to expand service days and hours to be equivalent to those provide for fixed route services; to provide next-day service; and to prohibit capacity constraints such as waiting lists, restrictions on number of trips allowed, or prioritization based on trip purpose.
 - 3. Comply with the ADA "one-car-per-train rule" which states that at least one-car-per-train shall be made accessible to people with disabilities.

- C. Provide all transportation provider employees dealing with the general public with training regarding awareness of people with disabilities.**
 - 1. Provide sensitivity and passenger assistance training sessions,
 - 2. Train personnel in the use of equipment used by people with disabilities.
 - 3. Train personnel in the importance of maintaining building access to ensure that ramps, lifts, curb cuts, elevators, etc., are all properly maintained and clear of obstructions.

- D. Provide improved opportunities for public involvement in the planning and implementation of accessible transportation services.**
 - 1. Utilize the disabled community for the formation of advisory groups which can identify effective solutions to accessibility problems.
 - 2. Develop a statewide advisory group to improve coordination between state agencies (including both transportation and human service agencies) in providing services to the disabled community, and encourage greater participation in regional advisory groups.
 - 3. Provide appropriate public documents in accessible formats as requested, including Braille, large print, audio tape, and computer disk.
 - 4. Choose only accessible sites for public meetings and provide a sign language interpreter on request.

- E. Encourage coordination among transit authorities and local communities for both fixed route and paratransit services to accommodate people with disabilities traveling within and over transit authority boundaries.**
 - 1. Advertise accessible fixed route and paratransit services and fares offered through media such as newspapers, radio, television, and community newsletters.
 - 2. Develop public awareness and support for accessibility projects through marketing and information dissemination.
 - 3. Encourage public and private non-profit providers of paratransit service to participate in the coordination of services through the Mobility Assistance Program.

- F. Promote awareness and the necessity of providing a minimum level of accessibility features at public and private sites and facilities. For example, the following features can be incorporated into site and facility design: accessible public transit stops, parking spaces, passenger loading zones, signals, signs, curb ramps, etc.**

V. ECONOMIC DEVELOPMENT

The Massachusetts transportation system shall serve as an engine that enhances the Commonwealth's competitive advantage, promotes economic development, and maximizes employment opportunities. This can be accomplished by creating a strong transportation infrastructure to support industry, attract growth, and position the Commonwealth prominently in the global marketplace.

- A. Determine which potential transportation projects and services will have the greatest impact on productivity and job growth, and make long-term economic impact one of the factors considered in setting project investment priorities.**
 - 1. Establish methods to determine which projects will have long-term economic or employment benefits by researching available methods for determining permanent economic impacts resulting from transportation investments.
 - 2. Conduct an ongoing assessment of which corridors, regions, facilities, and services will most encourage economic growth and business development. This can be accomplished by conducting meetings with statewide industry groups and regional business representatives to determine industry's state and regional transportation needs and define solutions that provide the greatest economic impact.
 - 3. Build into the transportation capital planning process a means to weigh permanent economic impact in setting project investment priorities, with impact measured in a weighted manner that reflects regional differences and does not disadvantage rural communities.
 - 4. Site transportation-related facilities such as transportation agency offices in economic nodes of cities and other compact urbanized areas.
 - 5. Encourage transportation operators to continue to include local, regional and state economic recovery/business development agencies and organizations in their planning process.
- B. Respond to opportunities for private economic investment through rapid funding of necessary transportation infrastructure associated with major development projects by maintaining adequate funding of the Public Works Economic Development (PWED) grant program which allows rapid funding of infrastructure directly associated with job-creating economic development projects.**
- C. Utilize transportation planning and investment decisions to assist disadvantaged areas and minority- and women-owned business enterprises.**
 - 1. Assess and address the transportation needs of disadvantaged areas targeted for development.

2. Encourage the implementation of transportation projects with the greatest positive economic and social impact on disadvantaged areas, with particular efforts made to provide assistance to minority and women-owned business enterprises.

D. Consider the unique needs of the Massachusetts travel and tourism industry in the development of the transportation system.

1. Improve access to tourist and travel facilities and attractions through better intermodal links (to allow travel to tourist destinations by alternative modes) and specific targeted investments, and by development of additional bicycle and pedestrian trails.
2. Encourage development of intermodal facilities that enhance the attraction of Massachusetts to both cruise ships and dedicated "cruise-ferry" vessels carrying freight and passengers to nearby locations such as Nova Scotia.
3. Ensure that the planning process recognizes that, in many cases, a scenic right-of-way is itself an important attraction whose character should be maintained.
4. Maintain clean, safe, accessible, and convenient restroom facilities and build additional facilities where needed, particularly on routes heavily used by tourists; develop and implement a plan that defines operating entities, funding mechanisms, and security responsibilities for these facilities.
5. Develop and maintain clean, safe, accessible, and convenient visitor centers at or near all key gateways to Massachusetts and on important tourist routes; develop and implement a plan that defines operating entities and funding mechanisms for these facilities.
6. Provide better travel information for tourists by developing cross-marketing programs between attractions, by providing improved transportation maps, and by utilizing computerized travel and tourist information systems.
7. Develop more comprehensive and clearer signs for tourist-related attractions, information centers, and businesses that are understandable to foreign visitors by continuing communications with the Massachusetts Office of Travel and Tourism the Executive Office of Transportation and Construction, and the Regional Tourist Councils.
8. Make Massachusetts' airports more visitor-friendly, with an emphasis on the needs of international visitors.

VI. ENVIRONMENT, LAND USE, AND QUALITY OF LIFE

The Massachusetts transportation system shall foster a sustainable society, one in which economic growth and environmental protection work in tandem, residents' quality of life is maintained, and the historic and scenic values that attract visitors to the Commonwealth are preserved.

- A. Ensure that the transportation sector does its fair share in achieving reductions in emissions and precursors of air pollutants to provide a healthier environment for the Commonwealth's citizens and visitors.
1. Vigorously implement all quantifiable mobile source emission control measures included in the State Implementation Plan (SIP) for Clean Air, and related transportation agency activities, to achieve or exceed projected reduction levels.
 2. Provide guidance and technical assistance to ensure that regional transportation plans and transportation improvement programs conform to the State Implementation Plan.
 3. Synthesize transportation policies and air quality improvement plans, and ensure that transportation initiatives support air quality goals.
 4. Encourage research and technology development to find new solutions to air pollution problems created by motor vehicles, including vehicle and power train innovations and alternative fuels. (See following section on alternative fuels.)
 5. Support the implementation of a new vehicle inspection and maintenance program that will include more thorough testing of the performance of motor vehicles in a simulated driving cycle.
 6. Support the development of a program to remove the most polluting vehicles from the vehicle fleet through an emissions trading and banking program.
 7. Update policies and practices of transportation agencies that control vehicle fleets to improve emission characteristics, such as improved maintenance practices and vehicle modifications.
 8. Seek to restrain growth in vehicle trips, vehicle hours of travel, and vehicle miles of travel through incentives, new technology, and imaginative planning.
 9. Support non-polluting modes of transportation, such as bicycling, walking, and other non-motorized forms of transportation.
 10. Encourage travelers to utilize, to the extent feasible, modes of transportation that produce the least pollution per passenger mile consistent with their trip purpose, travel distance, and personal needs.

B. Reinforce the objectives of the Massachusetts Energy Plan to achieve a long-term reduction in energy consumed by the movement of people and goods, and to increase energy supply security.

1. Stimulate the market for alternative-fuel vehicles:
 - Sponsor and fund a study to determine the relative safety of alternative fuel vehicles, particularly compressed natural gas (CNG), liquefied natural gas (LNG), and propane in tunnels and roadway underpasses.
 - Continue, in a cooperative venture with the Division of Energy Resources, an Electric Vehicle Pilot Program to test and evaluate 50 electric-powered vehicles.
 - Conduct alternative fuel demonstration and research programs, such as an Alternate Fuel Transit Van Program, and trials of bi-fuel pick-up trucks.
 - Assist in the development of an expanded refueling infrastructure for alternative fuels, such as natural gas, CNG, and recharging facilities for electric vehicles.
 - Comply with the alternative fuel vehicle purchase requirements of the National Energy Policy Act of 1992.
2. Participate in the Clean Cities Initiative, sponsored by the U.S. Department of Energy, which is intended to gather together stakeholders interested in diversifying energy resources and facilitating the expanded use of alternative fuels.
3. Implement an alternative fuel program among the Commonwealth's Regional Transit Agencies.
4. Encourage development of automotive technology that improves fuel efficiency and energy conservation.
5. Improve the energy efficiency of transportation buildings and other facilities.
6. Continue to improve the availability and quality of lower-energy modes of transportation, such as walking, bicycling, and public transportation.
7. Elevate the priority of energy use in transportation planning and investment by incorporating energy impacts in transportation decision making.

C. Minimize the impact of transportation projects and strategies on the Commonwealth's water supply by designing projects to avoid impacts on water resources, minimizing impacts when they are unavoidable, and mitigating impacts where they occur.

1. Adopt and implement Best Management Practices for construction and maintenance of highways and other transportation facilities which address stormwater management, including oil-water separation systems, sedimentation basins, filtration, and attenuation of runoff flow, and complete a program of testing and removal of old or leaking underground fuel storage tanks at state transportation facilities.
2. Set up a stormwater runoff attenuation demonstration to restore polluted shellfish beds.

3. Commission a study of sites across the state where highways and related facilities may impact the habitats of rare, protected, or endangered species, and commission a technical analysis of the impact of limited access highways on coastal area ecosystems.
4. Continue to explore ways to reduce or limit the road salt use without compromising public safety.
5. Adhere to the policy of "no net loss of wetlands" due to transportation projects, implement Best Management Practices for wetlands replication, and support efforts to establish a wetlands banking system.

D. Implement the recommendations of the transportation agencies' and authorities' Pollution Prevention and Resource Conservation Plans, prepared under the Clean State Initiative, Executive Order #350.

1. Avoid the use of hazardous materials to the extent possible; reduce the amount and toxicity of hazardous substances used; increase the proportion of recycled and other environmentally preferred materials procured; increase the rate at which waste materials of transportation operations are recycled; and conduct research on materials of lower toxicity that may serve as substitutes without compromising performance.
2. Maintain hazardous material and waste management policies and procedures to assure the safety of workers and the public.
2. Conduct energy audits and energy conservation programs to reduce the amount of energy used for space heating and cooling in buildings used by transportation agencies, energy used by roadway lighting, and other operational energy uses, and institute Best Management Practices for transportation construction and maintenance projects and programs.

E. Avoid, minimize, and mitigate noise and vibration impacts caused by transportation projects and facilities.

1. Support measures to reduce noise and vibration emanating from vehicles, such as accelerated conversion of aircraft fleets to Phase III type planes, expansion of the number of electrically-powered vehicles, and improved maintenance of state vehicles and railroad tracks.
2. Determine the effectiveness of physical containment, absorption, or reflection of noise generated by transportation facilities and vehicles by reviewing noise barrier technology for application along highways and railroad rights-of-way, and by developing specifications for noise control applications.
3. Undertake improvements to dampen noise and vibration caused by transportation facilities by installing barriers where noise levels are excessive, constructing other facilities and improvements that attenuate or reduce the impact of excessive noise, and installing vibration absorbing pads or layers along railroad tracks.

F. Strengthen the transportation infrastructure of established economic development centers.

1. Minimize extensions of new highway infrastructure into undeveloped or environmentally sensitive areas.
2. Provide the widest feasible choice of transportation alternatives for residents, visitors, and businesses in order to encourage and support a rational, economically efficient, and environmentally sensitive pattern of land use.
3. Support the economic reinvigoration of the state's cities, urbanized areas, and "economic opportunity zones" through targeted transportation infrastructure investments, increased use of underutilized infrastructure, and broad-based transportation planning activities.
4. Improve transportation services in areas of economic concentration, thereby encouraging more extensive use of energy-efficient modes of transportation and attracting higher density development.
5. Preserve and enhance sensitive natural resources through the implementation of an open space acquisition program; work cooperatively with land trusts, conservation commissions, and other state agencies.

G. Direct investment toward well-designed transportation facilities to achieve broad and long-lasting benefits for residents, employers, and visitors.

1. Broaden the Scenic Byway Program to protect and promote designated roads within the Commonwealth, in accordance with goals established by the FHWA Scenic Byway Advisory Committee; develop alternative design standards for scenic and rural roads that may not qualify for Scenic Byway designation, but that are scenically important.
2. Implement the Transportation Enhancements Program through the development of guidelines for project selection and administration in order to assure that the highest quality projects are selected throughout the Commonwealth, and that enhancement projects are completed according to specifications.
3. Participate with local, regional, and state agencies and authorities in the protection and restoration of historic and architecturally significant land and properties, particularly those that relate to historic transportation activity or are located near current or proposed transportation uses.
4. Develop well designed transportation projects that minimize impacts to the environment and to the quality of life of those living and working nearby.

VII. COST EFFECTIVENESS AND FINANCING

The Massachusetts transportation system will be planned, implemented, and operated in the most cost-effective and efficient manner, and innovative financing strategies shall be utilized to the maximum extent.

A. Improve transportation agency efficiency and effectiveness.

1. Create a Massachusetts Department of Transportation so that the transportation agency organizational structure reflects present-day needs for developing an effective, efficient, and coordinated approach to implementing a multimodal transportation system.
2. Initiate and continue strategic planning processes to ensure that all transportation agencies have a clear mission, that management is more alert to change and new opportunities, that decisions are made in a coordinated manner, and that management develops a more proactive posture.
3. Ensure that all transportation agencies develop strategic approaches to the application of information technology in order to increase operational cost effectiveness.
4. Involve employee representatives in the development of transportation agency policies and procedures.
5. Develop strategy-supportive organizational performance by structuring incentives to induce commitment to agency goals, to reward better performance, to foster an innovative organizational culture, and to improve quality of service delivery.

B. Expand the use of private contractors in service delivery.

1. Encourage employees of transportation agencies to compete with private contractors in bidding on contracts for service delivery.
2. Improve management of private contracts by requiring managers to perform cost analysis prior to contracting for service.
3. Expand contracting out to include the outsourcing of certain management functions.

C. Develop policies and initiatives that will reduce the amount of time that is currently required for project development, and that will improve the quality of project designs, resulting in fewer construction delays and cost overruns.

1. Improve transportation agency capability for in-house engineering and environmental work by re-examining the entire design/review process to determine causes of persistent process bottlenecks; by refining/improving project tracking systems; and by evaluating problems in the field attributable to design error or oversight.
2. Improve agency capability to review consultant designs by evaluating consultants' progress and quality of work more closely and regularly.
3. Streamline the contracting process (from consultant selection to design contract award) to reduce project development time without compromising project quality, and review statutory/policy constraints which delay the timely utilization of outside consultants.
4. Develop innovative contractual arrangements (i.e. incentives) to stimulate early completion and cost-saving proposals in design and engineering contracts, and pursue a more aggressive utilization of open-ended and multi-assignment design contracts.
5. Reduce the time needed for environmental approval through continued early coordination with local, regional, state, and federal environmental agencies:
 - Foster partnership concepts with environmental regulatory agencies to consolidate and streamline permit processes in areas of regulatory overlap.
 - Develop an Environmental Manual as a complement to the MHD Design Manual to incorporate the integration of environmental considerations from project development through construction and maintenance.
 - Provide on-going training to appropriate agency divisions and districts on environmental policies, processes and regulations.
 - Develop and issue fact sheets for design and construction personnel identifying appropriate technologies, methodologies, and best management practices to ensure proper adherence to environmental regulations and permits.
 - Gather and evaluate information on environmental issues early in the planning process to avoid possible future delays.
 - Develop standard specifications for construction contracts in areas identified by environmental regulatory agencies as on-going compliance problems.

D. Encourage private sector investment in transportation infrastructure.

1. Identify methods to provide incentives for private investment in transportation infrastructure, and support legislation to provide for greater involvement and investment from the private sector (e.g. leasing of public facilities, air/ground rights transfers, turnkey initiatives, and public/private development opportunities).
2. Approve legislation allowing for the design and construction of projects in one phase by the same contractor; design/build is more cost-effective and brings projects to completion more quickly.

- E. Develop funding strategies to optimize efficient use of all available funding sources for transportation.**
1. Explore all available options for creative financing of new major projects in Massachusetts including the consolidation of major metropolitan Boston highways into a single transportation system (i.e., the Metropolitan Highway System, including the Central Artery, Ted Williams Tunnel, Tobin Bridge, Callahan/Summner Tunnels, and the Turnpike Boston Extension) in order to coordinate pricing strategies and fund the construction, operation, and maintenance of the system as a whole.
 2. Maximize the Commonwealth's availability and utilization of federal funds for transportation by proactively soliciting Congress to make available previously apportioned federal funds, and by pursuing phased obligations for major multi-year federally-aided projects.
 3. Develop/maintain policies that will ensure an efficient, well-balanced use of state funds for transportation by maintain a stable state revenue flow for transportation (adjusted for inflation) in order to facilitate long term capital planning.
 4. Maintain gas tax funding for mass transit; explore the efficiencies of synchronizing activities of the MBTA and the regional transit agencies; and continue the process for the development of a forward-funding plan for the MBTA and the Regional Transit Authorities.
 5. Explore the use of joint ventures with private industry in connection with interstate rest areas and intermodal transportation centers, and explore partnerships with other state agencies (e.g., Massachusetts Land Bank).

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Accessing the Future

Part Two: Foundations for Planning

- Chapter 3: The Massachusetts Transportation System
- Chapter 4: Regulatory Framework for Transportation
- Chapter 5: The Planning Process in Massachusetts
- Chapter 6: Environmental Quality and Transportation
- Chapter 7: Financing Our Transportation System
- Chapter 8: ISTEA Management Systems

CHAPTER 3

THE MASSACHUSETTS TRANSPORTATION SYSTEM

From colonial days to the present, the Commonwealth of Massachusetts has been at the forefront of providing innovative transportation options to its citizens. In 1893, Massachusetts enacted legislation creating the first state highway commission in the United States; in 1897, the first subway in North America opened for service under Boston Common. This innovative spirit continues today with the planning and implementation of state-of-the-art transportation projects and programs throughout the Commonwealth.

The Commonwealth and its transportation infrastructure are defined by a number of physical and historical characteristics: Massachusetts is the third most-densely populated state in the nation with approximately 5% of the nation's population living in less than one-quarter of one percent of the nation's land area; over 90% of the population lives in metropolitan areas (as defined by the U.S. Census). The patterns of development of the Commonwealth's largest cities were determined well before the early 20th Century, unlike many cities in the south and west of the United States. These factors help define what Massachusetts is and to a large degree determine the characteristics of Massachusetts travel patterns.

Massachusetts highways are among the most heavily used in the United States but are also among the safest. The regional transit authorities (RTAs) and the Massachusetts Bay Transportation Authority (MBTA) serve over 746,000 riders each weekday. Intercity travel is provided by a host of private intercity bus carriers and Amtrak intercity train service. Logan International Airport handles over 60% of the passengers flying in the six-state New England region. The ports of Massachusetts are gateways for the entire New England region.

In order to maintain, improve, and expand this transportation system to adequately serve future demands, we must have a good understanding of the system as it exists today, of current demands on the system, and of travel patterns and conditions. This chapter addresses these issues: the first section describes the passenger transportation system and the service provided; the second section describes freight facilities and freight movement; and the third section describes transportation system users and travel patterns.

THE PASSENGER TRANSPORTATION SYSTEM

This section provides a description of the components of the Massachusetts passenger transportation system: the facilities that comprise the system, as well as how they are utilized. Although each mode is described individually for simplicity, it should be remembered that trips are often multimodal, that is, more than one mode is used. Because of this, the intermodal aspects of travel — the connections and coordination between modes — are critically important.

Highways

The majority of all trips taken by Massachusetts citizens on any given day is by private automobile. These trips occur on a statewide roadway network comprised of over 30,000 centerline miles (61,000 lane miles). Local roads, under the authority of the cities and towns, account for over 55% of all roadway lane miles. The remainder of the roadway network is under the control of the Massachusetts Highway Department (MHD), the Massachusetts Turnpike Authority (MTA), the Metropolitan District Commission (MDC), or the Massachusetts Port Authority (Massport).

Roadways are classified in terms of their functional importance and characteristics of service to the community that they serve: principal arterials, interstate highways, and other expressways have more restricted access control and primarily serve long distance trips with a high proportion of through traffic; local streets, collectors, and minor arterials have varying degrees of access to adjacent property and typically are used for shorter trips. Table 3-1 shows lane miles and centerline miles by functional classification.

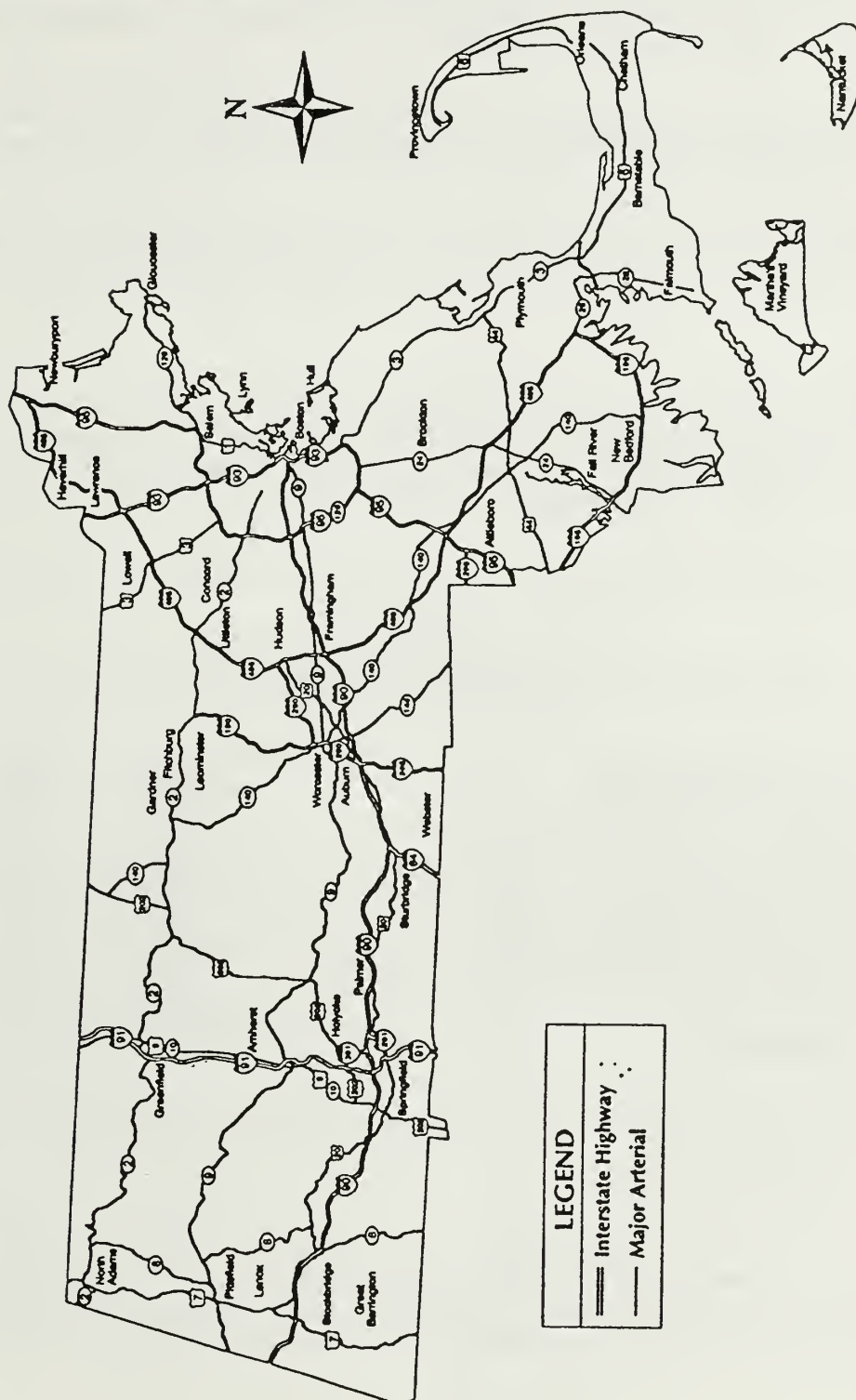
Table 3-1
1993 Massachusetts Centerline and Lane Miles by Functional Classification

(Source: Massachusetts Bureau of Transportation Planning and Development)

Functional Classification	Lane Miles		Centerline Miles	
Rural Interstate	782	1.3%	162	0.5%
Rural Other Principal Arterial	877	1.4%	324	1.1%
Rural Minor Arterial	1362	2.2%	663	2.2%
Rural Major Collector	3635	5.9%	1795	5.9%
Rural Minor Collector	2232	3.6%	1146	3.7%
Rural Local	10768	17.6%	6837	22.4
<i>Sub-total Rural:</i>	<i>19656</i>	<i>32.1%</i>	<i>10928</i>	<i>35.7%</i>
Urban Interstate	2376	3.9%	404	1.3%
Urban Other Expressway	802	1.3%	199	0.7%
Urban Other Principal Arterial	3929	6.4%	1552	5.1%
Urban Minor Arterial	6425	10.5%	3086	10.1%
Urban Collector	5012	8.2%	2511	8.2%
Urban Local	23059	37.6%	11888	38.9%
<i>Sub-total Urban</i>	<i>41602</i>	<i>67.9%</i>	<i>19640</i>	<i>64.3%</i>
Total Rural and Urban	61,258	100.0%	30568	100.0%

Major highways are shown in Figure 3-1. While the interstate system in Massachusetts comprises only 6% of the state's lane miles, it carries over 37% of the vehicle miles traveled (VMT).

Figure 3-1
Massachusetts Highway System



There are over 3,660,000 registered vehicles in Massachusetts: 86% are automobiles, and approximately 14% are trucks (the overwhelming majority of trucks are pickups and vans). There are 4.2 million licensed drivers in Massachusetts, out of a total driving age population of approximately 4.7 million adults. Massachusetts has fewer vehicles per licensed driver than the nation as a whole: one vehicle for every 1.14 Massachusetts driver compared to the national average of one vehicle for every 0.89 driver.

During 1992, Massachusetts vehicles traveled approximately 47 billion vehicle miles, or approximately 12,900 miles per vehicle. Total vehicle miles of travel (VMT) increased by 17% from 1982 to 1992.

Massachusetts has one of the safest highways systems in the nation. In 1993, there were 0.96 traffic fatalities per 100 million VMT, the lowest fatality rate per mile driven in the nation (in 1993 the national average was 1.56 fatalities per 100 million VMT).

Bridges

There are over 5,000 bridges in Massachusetts under state or local authority, the majority (57%) of which are highway bridges under the authority of MHD. Table 3-2 shows the number of bridges under the control of each governmental entity.

Table 3-2
Bridge Ownership
(Source: Massachusetts Highway Department)

Governmental Entity	Number of Bridges	% of Total
Massachusetts Highway Department	2,913	57%
Cities and towns	1,555	31%
Massachusetts Turnpike Authority	350	7%
Metropolitan District Commission	104	2%
Massachusetts Bay Transportation Authority	73	1%
Other agencies	42	1%
Statewide total	5,037	100%

Parking Facilities

The MHD, MBTA, MTA, Massport, and several regional municipal and private operators provide 155 park-and-ride facilities with over 39,000 spaces for those travelers who use carpools, vanpools, commuter buses, commuter rail, and rapid transit. In addition, the MBTA provides over 1,000 bicycle parking spaces at rapid transit and commuter rail stations.

Public Transportation

Massachusetts has an extensive public transportation system comprised of bus, paratransit, commuter rail, rapid transit, and light rail services. On an average weekday, approximately 750,000 riders use some form of fixed route public transportation. Another 11,000 passenger trips are made on demand responsive transit or paratransit each weekday.

Massachusetts Transit Agencies

Transit service is provided by fifteen regional transit authorities (RTAs) and the MBTA, as shown on Figure 3-2. On the average weekday, the RTAs and the MBTA operate over 40 locomotives, 240 commuter rail cars, 210 light rail vehicles, 410 rapid transit vehicles, 1,600 buses, 20 trolleys, and 700 paratransit vehicles.

Bus and Trackless Trolley

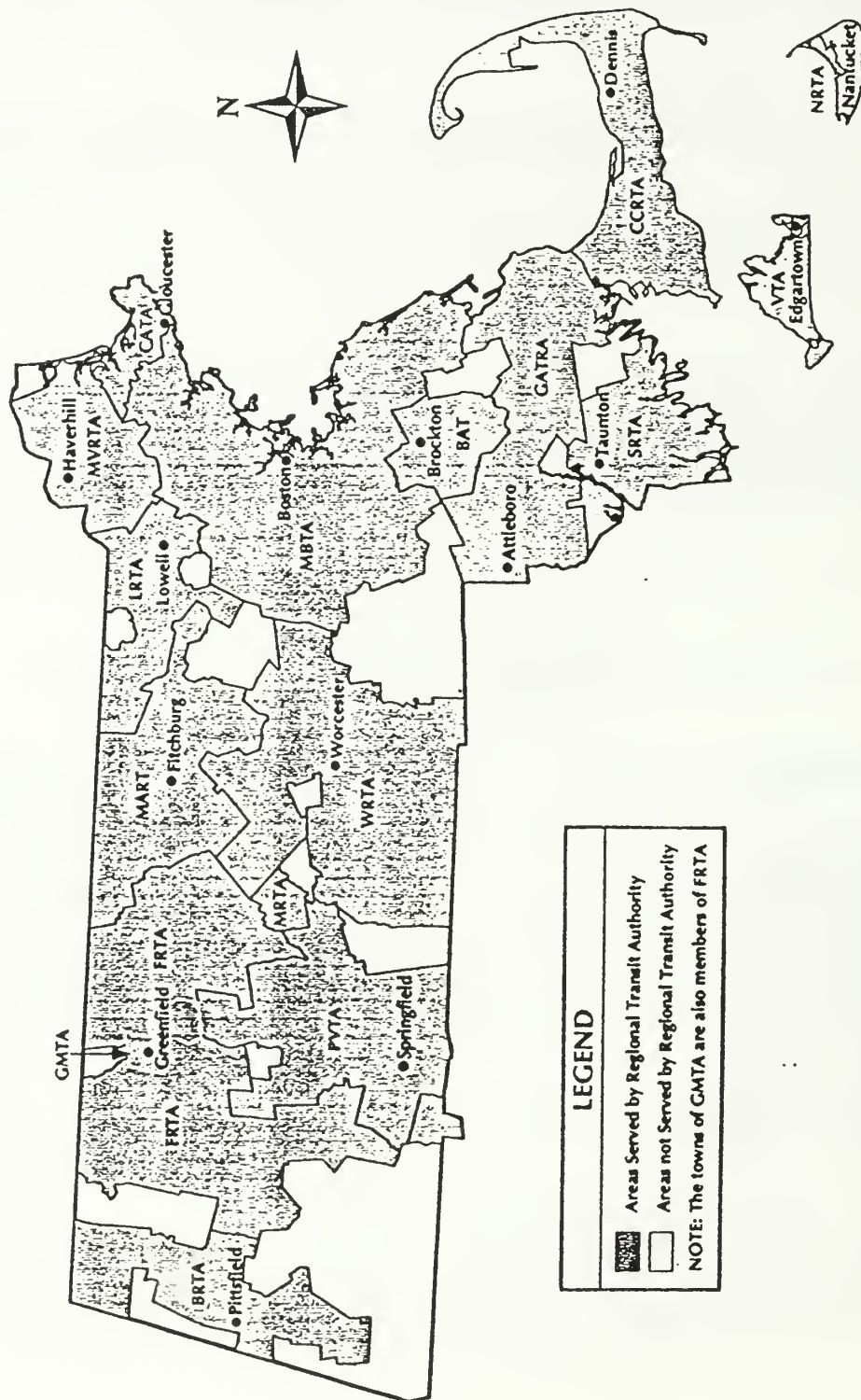
Fixed-route bus service is the most widespread form of public transportation in the Commonwealth. The MBTA operates its own fleet; the RTAs contract for service. In FY93, the RTAs contracted with over 190 transportation firms, which employed over 2,000 workers, to operate services. Table 3-3 shows average weekday bus route ridership for the MBTA and each RTA, one-way directional route miles, and the number of buses in the active fleet.

Table 3-3
MBTA and RTA Average Weekday
Fixed Route Ridership and Fixed Route Bus Operating Characteristics

(Source: 1993 FTA Section 15 Report)

Transit Authorities	Ridership	One-way Miles	Active Fleet (vehicles)
MBTA (Massachusetts Bay)	360,000	1,983	1,059
PVTA (Pioneer Valley)	41,450	621	212
WRTA (Worcester)	14,350	340	67
SERTA (Southeastern Mass)	13,150	190	77
BAT (Brockton Area)	12,200	300	51
MVRTA (Merrimack Valley)	4,900	382	45
LRTA (Lowell)	4,550	161	35
BRTA (Berkshire)	2,550	153	21
MART (Montachusets)	2,550	143	28
GATRA (Greater Attleboro)	2,100	292	23
CATA (Cape Ann)	700	524	7
VTA (Martha's Vineyard)*	700	4	5
GMTA (Greenfield, Montague)	550	NA	7
CCRTA (Cape Cod)	200	76	6
FRTA (Franklin)	50	NA	5
Average Weekday Total	460,000	4,880	1,650

Figure 3-2
Massachusetts Transit Authority Service Areas



In the MBTA district, nearly all bus routes connect with the rapid transit system or the light rail system in at least one location. Closer to Boston, buses provide cross-town service, feeder service to rapid transit stations, and line-haul service in heavily congested areas. Away from Boston, MBTA buses provide local service and connections to rapid transit and commuter rail lines.

Paratransit

All transit authorities in Massachusetts provide paratransit service to the elderly and to people with disabilities who cannot access the fixed-route system. In general, door-to-door service is provided by contractors with lift-equipped vans. Paratransit service offered by transit authorities must follow strict guidelines set by the Americans with Disabilities Act: by 1997, service must be provided within a 3/4-mile corridor of existing fixed-route service, during the same hours and days as fixed-route service, and must cost no more than twice the fixed-route fare.

Additionally, many cities and towns, Councils on Aging, and charitable organizations offer door-to-door paratransit service in wheelchair accessible vehicles. On an average 1993 weekday, these organizations utilized 700 vehicles to provide approximately 11,000 trips.

Light Rail and Rapid Transit

Figure 3-3 shows the MBTA rapid transit and light rail system. The MBTA light rail system, which operates in Boston, Brookline, Cambridge, and Newton, is comprised of the Green Line and the Mattapan High Speed Line. The Green Line consists of four radial routes: Boston College (B Line), Cleveland Circle (C Line), Riverside (D Line), and Arborway (E Line). The Green Line operates on over 23 miles of track and stops at 13 subway or elevated stations and 57 surface stops. The Mattapan High Speed Line operates between Ashmont and Mattapan. On an average weekday, there are over 189,000 boardings on the Green Line.

The MBTA rapid transit system, also shown on Figure 3-3, consists of three radial lines: the Red Line (21 miles), the Orange Line (11 miles), and the Blue Line (six miles). Together the three lines stop at 53 stations, over half of which are wheelchair accessible. All lines provide service to downtown Boston, and with the exception of the Red and the Blue lines, each of the three rapid transit lines and the Green line connect with each other. There are an estimated 366,000 weekday MBTA rapid transit system boardings.

Commuter Rail

The MBTA commuter rail system, shown on Figure 3-4, operates in eastern and central Massachusetts, as well as Providence, Rhode Island. The system consists of 11 lines operating on 265 route miles. There are 101 stations (39 of which are wheelchair accessible) with a total of over 16,000 parking spaces. The five northern lines terminate at North Station with connections to the Green and Orange lines; the six southern lines terminate at South Station where passengers can transfer to the Red line, Amtrak service, local MBTA bus service, or to intercity bus service.

Figure 3-3
MBTA Rapid Transit Map

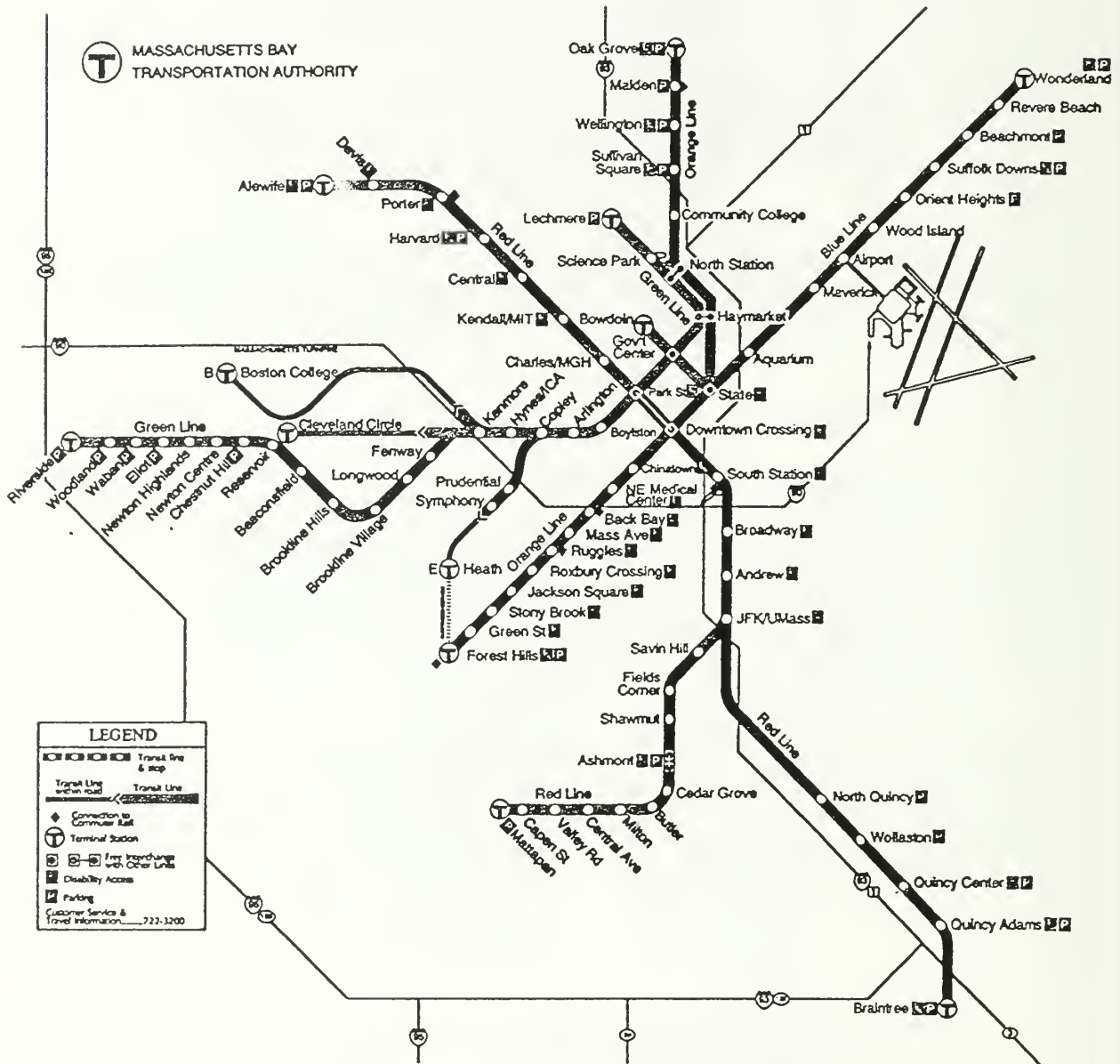
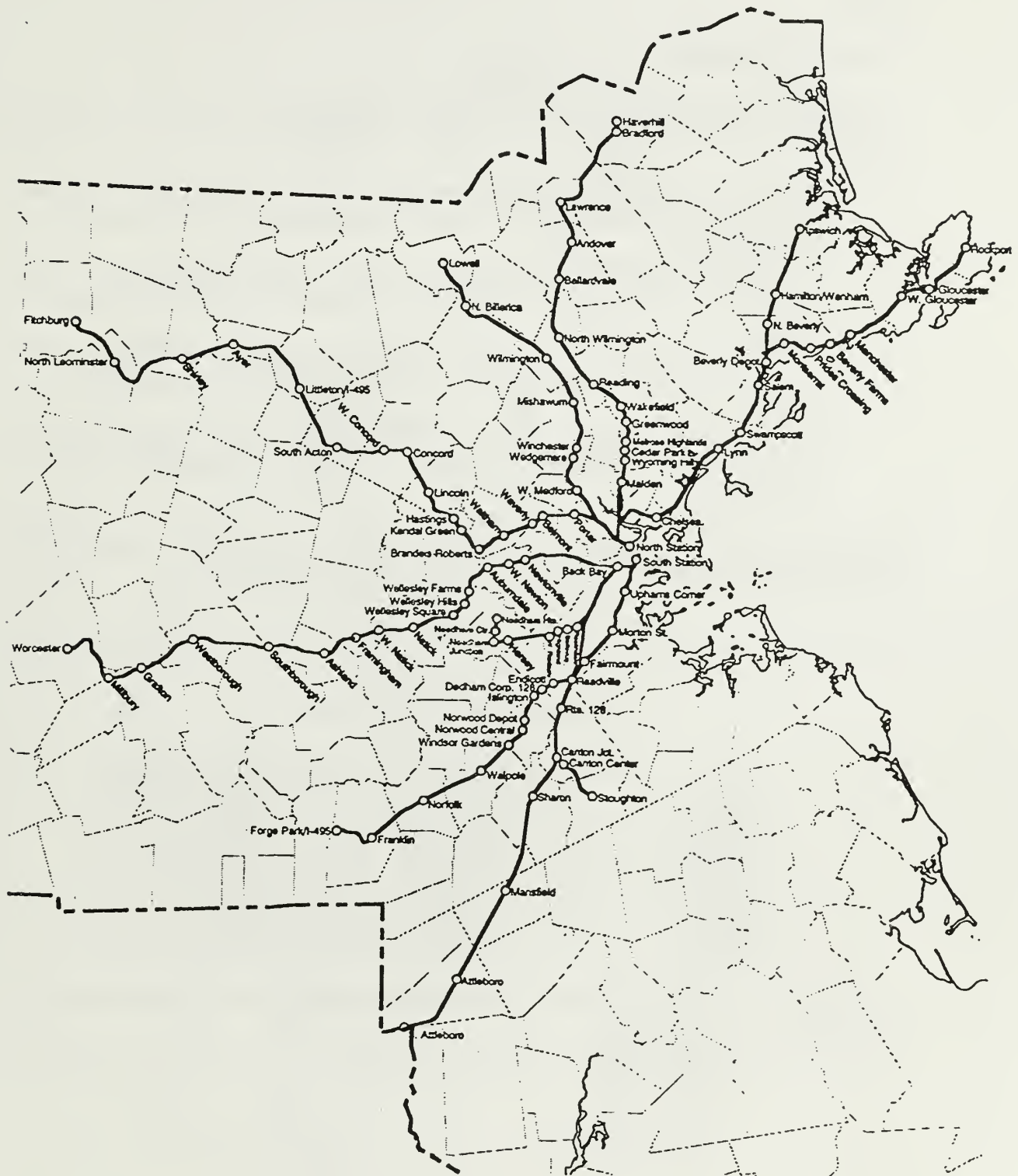


Figure 3-4
MBTA Commuter Rail Map



Together the 11 lines serve over 83,000 daily riders. In September 1994, the MBTA extended commuter rail service from Framingham to Worcester; additional service extensions are under study.

Intercity Passenger Rail

Intercity passenger railroad operations in Massachusetts, shown on Figure 3-5, are provided by Amtrak on several routes:

- Northeast Corridor service operates between Boston and New York City via Providence, Rhode Island and New Haven, Connecticut with continuing service to Washington, D.C.
- Lake Shore Limited service operates between Boston and Chicago with Massachusetts stops in Framingham, Worcester, Springfield, and Pittsfield (one daily trip).
- Vermonter service operates between St. Albans, Vermont, and New York City, with a Massachusetts stop at Springfield; bus service is provided between St. Albans and Montreal.
- Cape Codder service operates between route between Hyannis on Cape Cod and New York City on weekends during the summer by way of Taunton and the Northeast Corridor line.

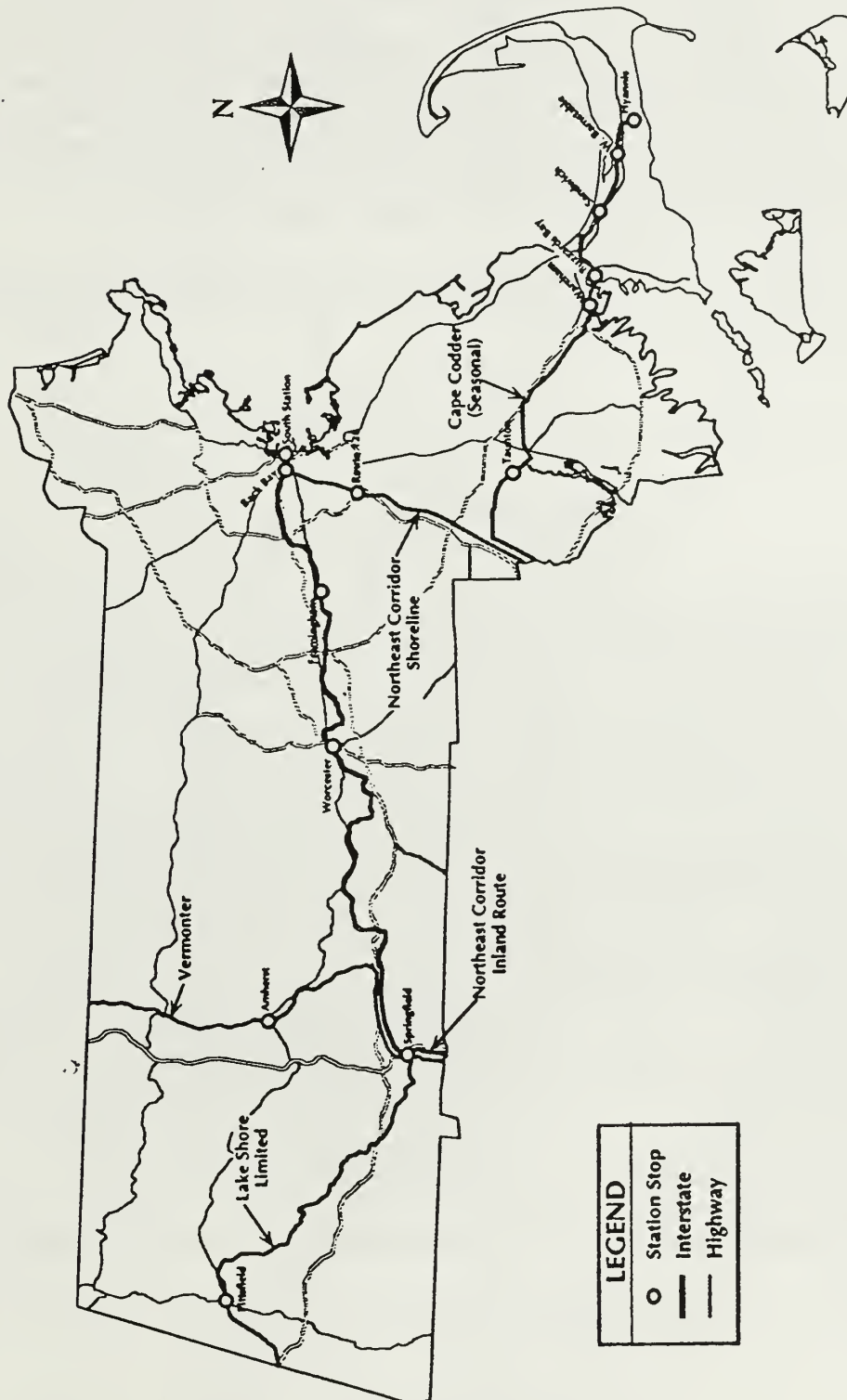
As shown in Table 3-4, average daily ridership on the intercity rail routes is approximately 3,500; average seasonal weekend-day ridership on the Cape Codder is 190.

Table 3-4
Intercity Rail Ridership (1993)
(Source: Amtrak)

City	Annual Ridership	Average Daily Ridership
Boston*	1,069,120	2,930
Springfield	153,550	420
Worcester	40,130	110
Framingham	8,480	20
Pittsfield	3,640	10
Amherst	3,470	10

*The Boston figure reflects total ridership at all three Boston area stations: South Station, Back Bay, and Route 128.

Figure 3-5
Amtrak Service Map



Intercity Bus

Intercity bus service in Massachusetts is provided by seventeen private-carrier bus companies (shown on Table 3-5) operating one or more scheduled intercity or long distance routes.

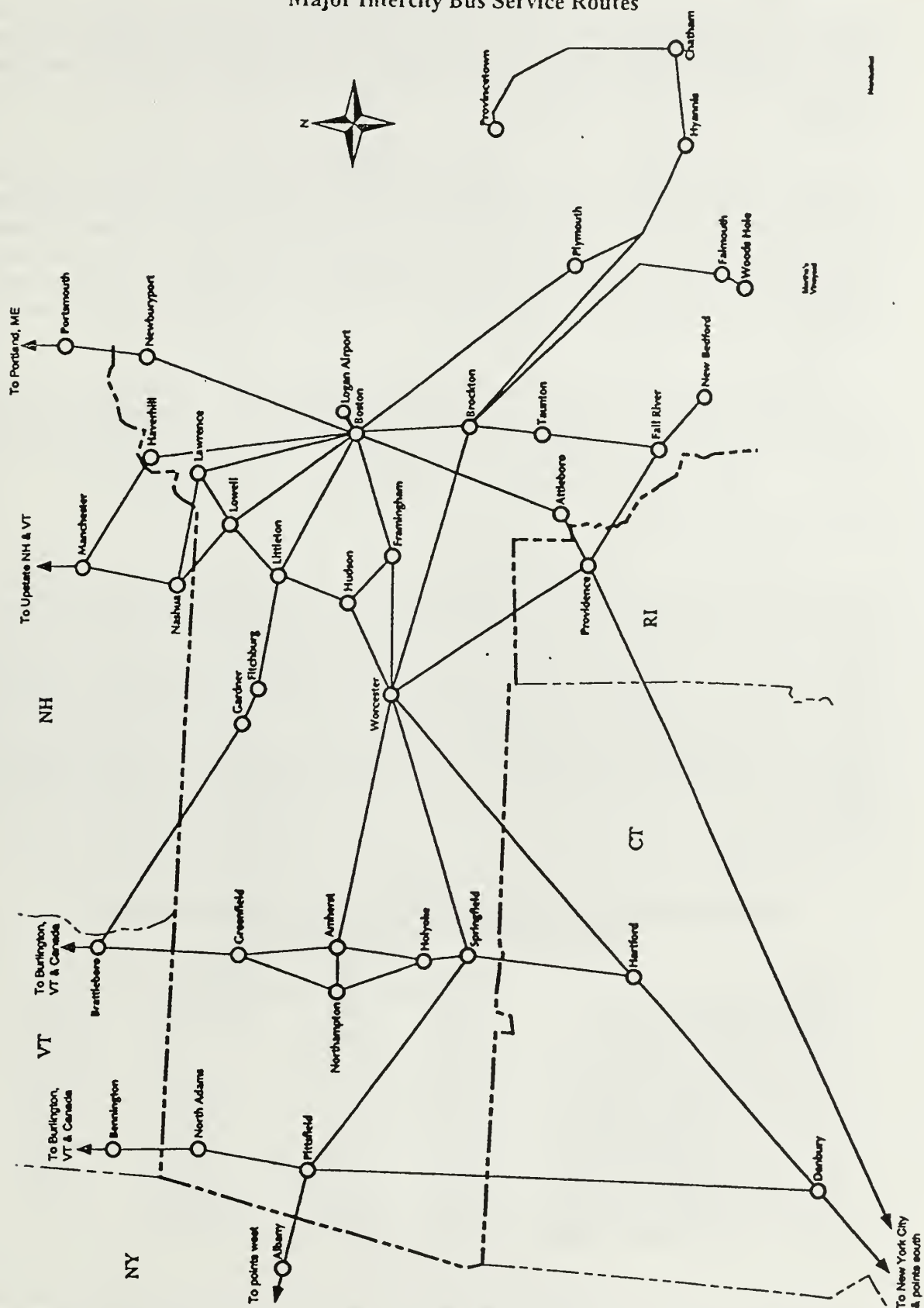
Figure 3-6 shows the major intercity bus routes serving Massachusetts. The size and nature of service varies greatly among these companies: in the Boston region, major routes run to the South Shore, Cape Cod, the North Shore, and to the western suburbs; in the western part of the State, Springfield, Greenfield, and Amherst are the major terminal points for service; Worcester serves as the regional hub for central Massachusetts. Many of the private carriers also provide service from eastern Massachusetts and bordering states to Logan Airport.

Interstate service is provided from Rhode Island and New Hampshire to the Boston area; longer-distance interstate travel is provided to all major cities in the eastern United States, with connections to the rest of the country.

Table 3-5
Private Intercity Bus Carriers
(Source: Boston MPO Central Transportation Planning Staff)

Intrastate service	Service area
American Eagle Motor Coach	New Bedford to Boston
Bloom's Bus Lines	Fall River, Brockton, Taunton to Boston
Brush Hill Transportation	Milford to Boston
Carey's Bus Lines	Weymouth, Rockland to Boston
Cavalier Coach Corporation	Northborough to Boston
Gulbankian's Bus Lines	Hudson, Marlboro to Boston
Interstate Coach	Bridgewater, Middleborough to Boston
Plymouth & Brockton Company	Plymouth, Brockton, Cape Cod to Boston
Trombly Commuter Lines	Lawrence, Andover to Boston
Yankee Line	Acton, Concord, Littleton to Boston
Interstate and intrastate service	
Bonanza Bus Lines	Providence, NYC, Cape Cod to Boston
C&J Trailways	Coastal New Hampshire to Boston
Concord Trailways	New Hampshire, Maine to Boston
Greyhound Lines	Springfield, Worcester, Boston to NYC
Peter Pan Bus Lines	Cape Cod, Boston, Worcester, Springfield, Franklin County, Pittsfield to NYC, Albany & beyond
Timberlane Coach/The Coach Company	Seabrook, NH Newburyport to Boston
Vermont Transit Company	Springfield, Greenfield, Boston, to Vermont and NYC

Figure 3-6
Major Intercity Bus Service Routes



Water Passenger Transportation

A network of commuter ferries provide service that connects several Boston-area destinations: daily commuter ferry service operates between Boston and both Hingham and Hull, as well as between Rowes Wharf and Logan Airport, the Charlestown Navy Yard, and Long Wharf in Boston. Approximately 2,700 passenger trips are made on commuter boats each weekday.

Coastal ferries serve Provincetown on Cape Cod and the islands of Martha's Vineyard and Nantucket. Seasonal ferry service operates from Provincetown to Boston during the summer; year-round ferry service operates from Martha's Vineyard and Nantucket to Hyannis, Woods Hole, and New Bedford on the mainland. The islands are heavily dependent upon water-based transportation for both passenger service and goods supply. Approximately 2.5 million annual passenger trips are made on the ferry routes between Martha's Vineyard, Nantucket, and the mainland.

Ferry service is not the only water-based passenger transportation in Massachusetts. Boston is once again becoming a popular port of call for cruise ships. Docking facilities for these ships are located at the 1,000-foot long Black Falcon Terminal which is owned and operated by Massport. In 1992, 34 cruise ships, carrying 18,300 passengers, docked at the Terminal.

Air Passenger Transportation

Massachusetts has 52 public-use aviation facilities: 27 publicly-owned airports, 19 privately-owned airports, five seaplane bases, and one heliport. There are also 226 privately-owned non-public-use aviation facilities: 59 landing strips, 35 seaplane bases, and 131 helipads. Nine Massachusetts airports are designated as transport (TRANS) airports (able to serve virtually all types of aircraft with equipment for precision instrument approaches) or Primary Commercial Service (PCS) Airports (over 10,000 annual enplanements), or both. Table 3-6 lists the nine airports that qualify as TRANS and/or PCS airports, as well as annual enplanements (passenger boardings) on scheduled air services and aircraft operations (aircraft arrivals and departures). Figure 3-7 shows their location, as well as the location of significant general aviation and military airports.

Table 3-6
Massachusetts Airport Annual Operations and Passenger Enplanements

(Source: Massport; Massachusetts Aeronautics Commission)

<u>Airport</u>	<u>PCS</u>	<u>TRANS</u>	<u>Enplanements</u>	<u>Operations</u>
Logan International Airport	YES	YES	12,600,000	470,000
Hanscom Field (Bedford)	NO	YES	NA	188,000
Barnes Municipal (Westfield)	NO	YES	NA	59,000
Nantucket Memorial Airport	YES	YES	200,000	115,000
Barnstable Municipal Airport	YES	YES	154,000	108,000
Worcester Municipal Airport	YES	YES	72,000	57,000
Martha's Vineyard Airport	YES	NO	51,000	53,000
New Bedford Regional Airport	YES	YES	18,000	78,000
Provincetown Municipal Airport	YES	NO	11,000	

A detailed map of New Brunswick, Canada, illustrating its transportation infrastructure. The map includes numerous airports marked with airplane icons and labeled with names such as Miramichi, Moncton, Saint John's, and Fredericton. Major interstates are shown as thick solid lines, while other roads are represented by thinner dashed or dotted lines. A legend in the bottom right corner defines the symbols used. A north arrow is positioned in the upper left quadrant. The map also shows the coastline, major rivers like the Saint John River, and surrounding areas including parts of Nova Scotia and the Gulf of St. Lawrence.

Boston's Logan International Airport is the tenth busiest airport in the country, and the seventeenth busiest in the world. It serves as the primary gateway for air travel for the New England region, accounting for 63% of all regional enplanements. In 1993, there were over a half million aircraft operations at Logan serving over 24 million passengers. Sixteen percent of boarding passengers had international destinations; 14% went to New York City; 12% went to the west coast; 11% went to Florida; 10% went to states in the Northeast Corridor; and 37% went to other various domestic destinations.

Logan has the highest usage of alternative ground access services of all the airports in New England: 10% of passengers arrive at the airport by rapid transit; 9% use express buses; and 0.5% use passenger ferries. All Massachusetts commercial service airports can be reached by private autos, taxis, limousines; some have scheduled bus service.

Bicycle Transportation

Approximately one-half of one percent Massachusetts residents bicycle to work, mostly utilizing the roadway system. A significant number of bicycle commuters take advantage of a number of dedicated-use bicycle paths. Table 3-7 lists the state's long-distance bicycle paths. The longest is the 155-mile Claire Saltonstall Bikeway which runs from Boston to Provincetown with a spur from the Cape Cod Canal to Woods Hole.

Table 3-7
Existing Long-Distance Bicycle Facilities
(Source: Massachusetts Bureau of Transportation and Development)

Facility	Length (miles)	Location
Claire Saltonstall Bikeway	155	Boston to Provincetown, Cape Cod Canal and Woods Hole
Cape Cod Rail Trail	20.0	Dennis to Eastham
Dr. Paul Dudley White Path	17.9	Boston, Cambridge, Watertown, Newton
Minuteman Commuter Bikeway	11.1	Bedford, Lexington, Arlington
Norwottuck Rail Trail	8.5	Northampton, Hadley, Amherst

Note: Extensive bicycle path systems are also found on Martha's Vineyard and Nantucket.

Pedestrian Transportation

The urban character of Massachusetts' traditional downtowns, which are compact in design and densely populated with a mix of residences, retail establishments, and work locations, make them well-suited for walking. The proportion of total average weekday person trips made by walking is higher in Massachusetts than the national average.

According to the 1990 U.S. Census, 5.4% of all Massachusetts workers walk to work, a higher proportion than for bus, rapid transit, or bicycling. In Williamstown, Cambridge, and Amherst the percentage of commuters who walk to work is close to 25 percent. In downtown

Boston, a recent study showed that 48% of all downtown-only trips are by walking, more than by automobile and transit combined.

Commuter Options Programs

The MHD provides for the operation of a Statewide Commuter Options Program to inform, educate, and assist commuters and businesses of the benefits of using modes of transportation other than driving alone. The Program provides the following services:

- Assistance in the formation, funding, and operation of employer-based Transportation Management Associations (TMAs).
- Provision of on-site commuter transportation services, currently provided to over one hundred corporate clients.
- Dissemination of travel information regarding public transportation routes, schedules, and fares; bicycle and pedestrian facilities; parking locations, availability, and cost; telecommuting options; and, general travel demand management planning and strategies. Over 9,000 customers utilized the Program's information services in 1994.
- Assistance in the formation of carpools and vanpools through personalized rideshare matching provided to over 7,000 clients.
- Formation and operation of Program-sponsored vanpools; in 1994, over 200 vanpools were in operation, with over 3,000 riders.

FREIGHT TRANSPORTATION FACILITIES AND SERVICES

The passage of ISTEA and an increasing private-sector emphasis on competitiveness have highlighted the importance of efficient and effective freight movement for our state and regional economy. This section reviews the Commonwealth's principal freight services and facilities and briefly describes the support they provide to the Commonwealth's economic activities.

The chief characteristics and facilities of the following freight modes are described in this section: commercial trucking, rail freight, marine-based freight, air freight, and pipelines. However, different modes and services are often used in combination, i.e., intermodally, in order to achieve the delivery schedules and efficiencies required by users. Table 3-8 lists the most active Massachusetts intermodal freight facilities and modes accommodated. Note that this list does not include facilities that serve only one freight mode, for example, the numerous trucking-only terminals. Moreover, manufacturing plants and warehouses under private ownership and operation are not listed.

Truck Freight

The majority of the commercial trucks in the state are operated in private fleets owned by firms to support their primary business i.e., manufacturing, wholesale, retail, service, etc. An example of this type of operation is a large retail chain with its own fleet of tractor-semitrailers delivering goods to the retail outlets from regional distribution warehouses.

Table 3-8
Intermodal Freight Facilities
 (Source: Boston MPO Central Transportation Planning Staff)

Facility	Modes Accommodated
Massport Conley Terminal	Water/Rail/Truck
Massport Moran Terminal	Water/Rail/Truck
New Bedford/Fairhaven Harbor	Water/Rail/Truck
Fall River Harbor	Water/Rail/Truck
Salem Harbor	Water/Rail/Truck
Chelsea Creek	Water/Rail/Truck
Weymouth Fore River	Water/Rail/Truck
Worcester Municipal Airport	Air/Truck
New Bedford Municipal Airport	Air/Truck
Barnstable Municipal Airport	Air/Truck
Nantucket Memorial Airport	Air/Truck
Logan International Airport	Air/Truck
Westover Metropolitan Airport	Air/Truck
Barnes Municipal Airport	Air/Truck
Fort Devens	Air/Truck
Weymouth U. S. Naval Air Station	Air/Truck
Hanscom Field	Air/Truck
Martha's Vineyard Airport	Air/Truck
P&W Wiser Avenue	Rail/Truck
New Intermodal Terminal	Rail/Truck
Springfield Terminal	Rail/Truck
Fort Devens Terminal	Rail/Truck
Beacon Park	Rail/Truck
P&W Southbridge St	Rail/Truck
Worcester Conrail	Rail/Truck

Many trucks are also operated by for-hire carriers, which can be either truckload and less-than-truckload (LTL) carriers. Truckload carriers are those firms that pick up a load (usually greater than five tons) and move it directly from origin to destination, typically over a long distance. LTL operators perform regional and localized pickups and deliveries of smaller quantities of freight to terminals where loads are then aggregated for long-haul movements by a truckload carrier. Once the truckload carrier arrives at the destination terminal, the load is disassembled and delivered to the final user by an LTL operator.

In 1993 there were approximately 34,000 commercial vehicles and semitrailers registered in Massachusetts for private or for-hire use. A 1992 annual report compiled by the Interstate Commerce Commission listed 20 Class I and II (annual revenues above \$1 million) for-hire trucking companies based in Massachusetts with operating revenues ranging from \$27.8 billion

to \$5 million. Building materials, processed foods, tools, and petroleum products are the highest-volume goods shipped by Massachusetts trucking firms.

Rail Freight

Ten rail freight carriers operate service on more than 1,000 route miles throughout the Commonwealth (42% of this mileage is publicly owned). Table 3-9 lists Massachusetts railroads by type; Figure 3-8 shows Massachusetts freight rail lines.

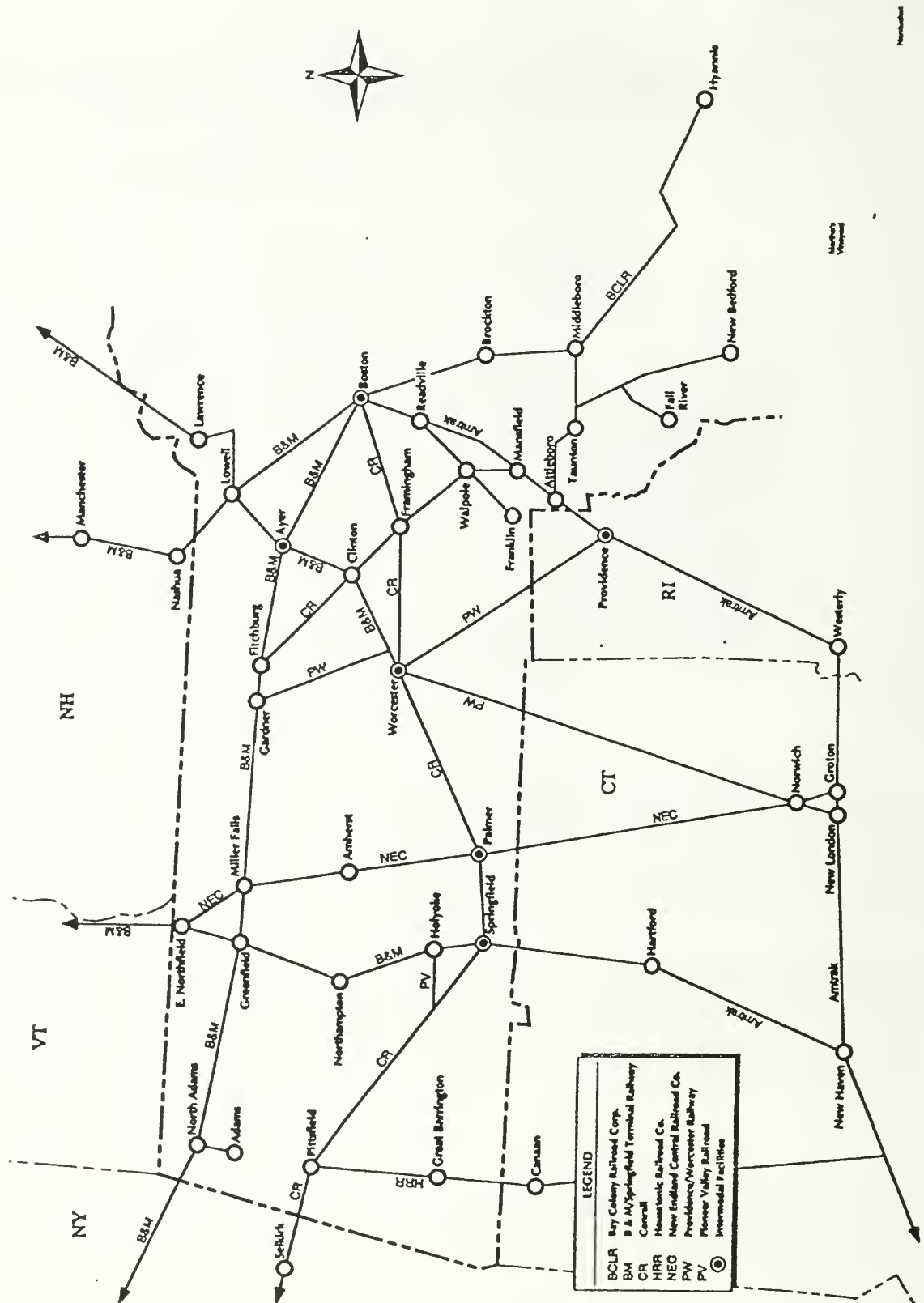
Table 3-9
Freight Rail Carriers by Type
(Source: Boston MPO Central Transportation Planning Staff)

Carrier	Railroad Type	Route Mileage
Conrail	Class I	417.5
B&M/Springfield Terminal	Class II	335.2
New England Central	Class II	55.0
Providence & Worcester	Regional	68.1
Bay Colony Railroad	Local	120.2
Grafton & Upton Railroad	Local	14.1
Housatonic Railroad	Local	35.9
Pioneer Valley Railroad	Local	27.6
Quincy Bay Railroad	Local	2.0
Massachusetts Central Railroad	Switching & Terminal	23.4

Massachusetts rail carriers provide essential transportation connections in support of domestic and international trade. While five of the ten carriers operate only within the state, they also transfer freight to and from interstate railroads. The major products shipped in New England and Massachusetts by rail include pulp and paper; lumber and wood products; hazardous materials; food; transportation equipment; stone, clay, and glass; and non-metallic minerals.

The Conrail New England Division main line, which runs from Boston to Albany, serves as the major east-west rail corridor for interstate service in Massachusetts and serves to connect the national rail system to most of the other lines. Intermodal service facilities in Worcester, Springfield, Palmer, Ayer, and Boston provide container freight transfer and handling for a wide range of commodities.

Figure 3-8
Massachusetts Freight Rail Map



Marine Freight and Commercial Port Facilities

Figure 3-9 shows the major ports in Massachusetts. In 1991, three Massachusetts ports (Boston, Fall River, and Salem) were ranked among the top U.S. 150 ports in terms of total tonnage. The principal types of cargo handled by the Commonwealth's ports are

- petroleum and other fuels;
- dry bulk cargo such as cement, scrap metal, gypsum, salt, and stone;
- containerized cargo including machinery, frozen fish, and electronics;
- non-fuel liquids such as vegetable oils and chemicals; and
- general cargo including autos, fresh fruit, waste paper, and iron/steel.

In 1993, Massachusetts ports handled 26 million tons of freight. The quantity and types of cargo handled by the leading ports is presented in Table 3-10. Petroleum and oil products are the dominant commodity shipped through these ports.

Table 3-10
1992 Massachusetts Port Freight Shipments

(Source: US Army Corps of Engineers)

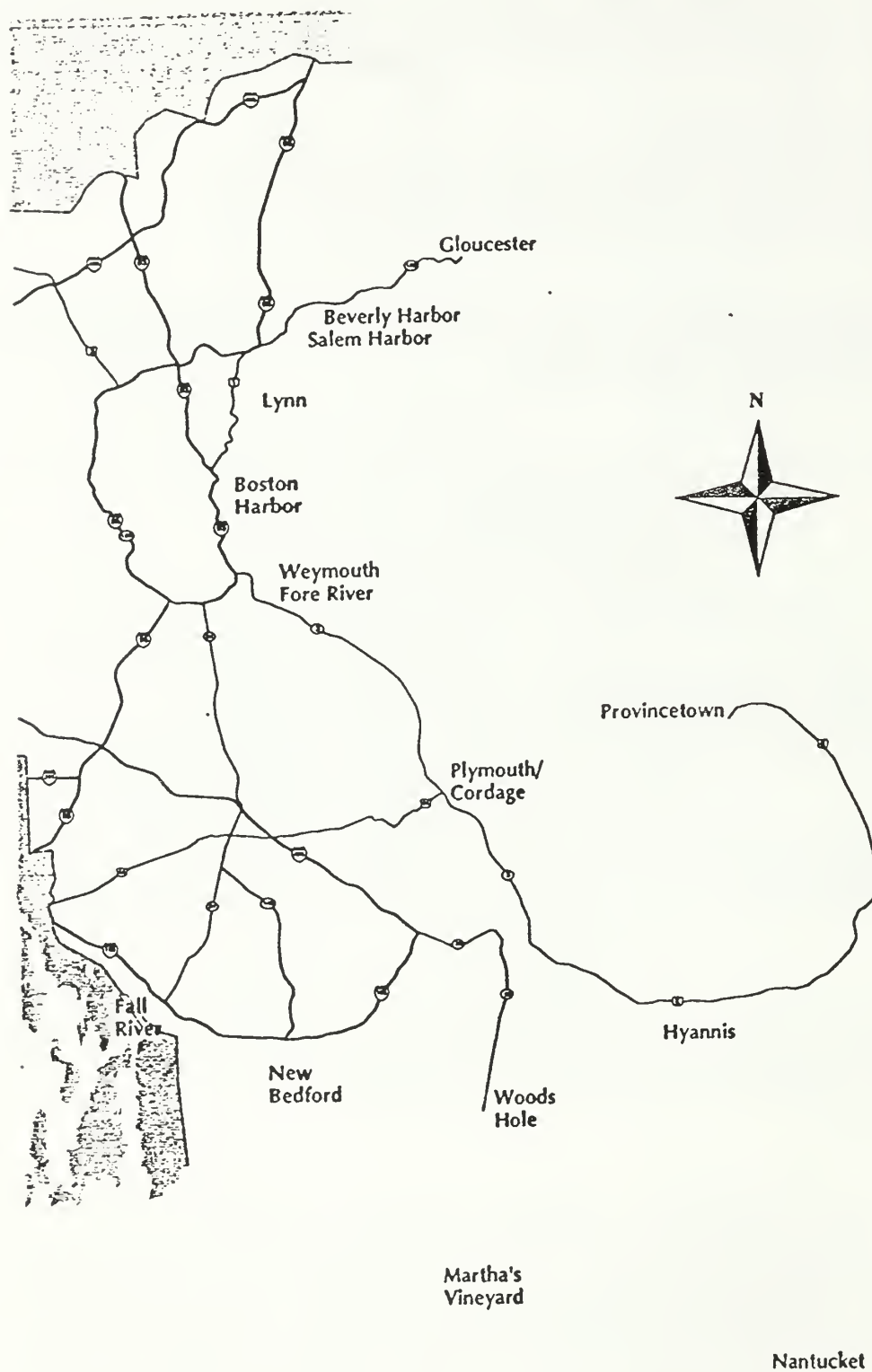
Port	Annual Volume (tons)	Main Commodities
Boston (includes Chelsea Creek, Mystic River and Weymouth/Fore River.	19,207,000	Petroleum, chemicals, dry bulk
Fall River	3,530,000	Coal, petroleum
Salem	1,400,000	Coal, Petroleum
New Bedford	484,000	Petroleum, fish
Woods Hole	301,000	Petroleum
Vineyard Haven	265,000	Goods, food products

Massachusetts is also a major player in the nation's fishing industry: in 1993 the Port of New Bedford ranked second among U.S. fishing ports by value of catch, largely due to the value of the scallop trade; Gloucester was ranked twelfth by value of catch.

Port of Boston

The Port of Boston is the Commonwealth's major gateway for international shipping. The port's major public cargo facilities are the Conley Terminal and the Moran Container Terminal. Conley Terminal (South Boston) is a 101-acre multi-berth terminal with 50 acres of storage space; it handles approximately 35,000 general cargo containers per year. Moran Container Terminal (Charlestown) handles approximately 41,000 general cargo containers per year and has 50 acres of container storage space. The Harbor Gateway Terminal (South Boston) consists of three separate facilities: the Black Falcon Cruise Terminal, the Massport Marine Terminal, and

Figure 3-9
Ports of Massachusetts



the Boston Army Base Terminal. In addition to these publicly-owned facilities, the Port of Boston contains a number of privately-owned terminals and cargo facilities which handle oil and petroleum products. These facilities are located primarily along the Mystic River and Chelsea Creek in Everett, Chelsea, and Revere.

Trucks provide most of the Port of Boston's landside port access. The main Massport facilities, however, have rail access: Springfield Terminal Railway provides rail service between Moran Container Terminal and Ayer-Fort Devens; Conrail provides service near the Conley Terminal. The port's major trading partners are Japan (37% of international trade) and northern Europe (34%), followed by the Mediterranean countries, Australia and New Zealand, and South America.

The Port of Fall River

The Port of Fall River, the Commonwealth's second busiest commercial port, is located on the Taunton River approximately 17 miles northeast of open ocean. The main approach channel to the port begins in Narragansett Bay continuing into Mount Hope Bay and the Taunton River. The main general cargo facility, the State Pier, is operated by private firm, Fall River Line Pier, Inc. This ten-acre facility on the east side of the Taunton River contains 100,000 square feet of covered storage area and a large amount of open storage space. Three railroad tracks (part of the Conrail system) run the full length of the State Pier Terminal and connect at Taunton to all of southern New England and to inland points.

The Port of Salem

Salem's Designated Port Area is an area of deep water and associated landside industrial facilities, including a large coal- and oil-fired power plant and a large oil storage facility. The Salem Terminal Wharf is capable of handling 750-foot vessels and the facilities are served by 35-foot draft tankers and 38-foot draft coal ships. Salem almost exclusively handles coal and oil products.

The Port of New Bedford

The Port of New Bedford is located on the Acushnet River approximately three miles north Buzzards Bay. The Port includes facilities in both New Bedford on the west side of the river and in Fairhaven on the east side. The main general cargo facility is the 6.5-acre State Pier with approximately 140,000 square feet of enclosed storage space.

Air Freight

In Massachusetts, the majority of air freight is shipped into and out of airports that also handle air passenger traffic. Since air freight shipment patterns are similar to the travel patterns of business passengers, and most air cargo is shipped in the cargo holds of passenger planes, the airports with most passenger enplanements also handle the most freight. Therefore, Logan Airport is the busiest air freight facility in Massachusetts. The major parcel carriers, Federal

Express and UPS, operate air cargo facilities at Logan Airport. Table 3-11 presents information on freight and mail operations at Logan Airport.

Table 3-11
1994 Logan International Airport Cargo and Mail Activity (tons)

(Source: Massport Aviation and Planning Unit)

Freight Type	Domestic	International	Total
Mail	66,700	4500	71,200
Express/Small Packages	207,100	100	207,200
Other Freight	93,000	89,000	182,000
Total	366,700	93,600	460,400

Pipelines

The state's pipelines carry the bulk of the natural gas used in the Massachusetts, as well as a small percentage of the petroleum products. There are three main natural gas pipelines serving Massachusetts. The Tenneco main line enters the state near Pittsfield, branches north to serve the Adams area, and continues east to Northampton and Framingham. The Granite State Transmission System connects to the Tenneco network at Haverhill. The Algonquin Gas Transmission Company owns and operates a main pipeline with two branches in the state: one serving Fall River, New Bedford, Plymouth, and Sagamore; the other serving Boston suburbs.

TRAVEL PATTERNS AND TRENDS

The preceding section described the Commonwealth's transportation system as one that has evolved and expanded to become what it is today: a diverse yet interdependent network of facilities and services that move large numbers of people and quantities of goods on a daily basis. This section discusses some of the societal changes that affect the demands placed on our transportation system.

Changes in Demographics and Socioeconomic Indicators

Travel patterns in the Commonwealth have changed over the last several decades in response to population and household changes, changes in the state, national, and global economies, advances in technology, and shifts in the location of businesses. Accelerated growth of the suburbs, the influx of women into the labor force, and increasing vehicle ownership are a few of the factors that have altered the Commonwealth's travel patterns and commuting characteristics.

Through the 1970s and 1980s, employment growth exceeded population growth, and travel patterns became more dispersed resulting in longer trip lengths. Moreover, between 1970 and 1990 population increased by 6%, while the number of households increased by 27%, with a corresponding decrease in household size from 3.09 in 1970 to 2.58 in 1990. The combined

effect of the robust employment and household growth was a rapid increase in vehicle miles traveled (VMT). In fact, VMT increased at a faster rate than both population or household formation. These employment and household growth rates will moderate in coming years. But as shown in Table 3-12, vehicle travel, which includes work and non-work trips, is expected to continue to increase at an estimated annual rate of about 1.4% from 1990 to 2010.

Table 3-12
Statewide Daily Vehicle Miles of Travel (thousands)
 (Source: Massachusetts Bureau of Transportation Planning and Development)

	<u>1990</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>
Daily Vehicle Miles of Travel	126,509	144,033	156,019	168,009

In 1990 the population of New England was 13.2 million, with Massachusetts accounting for about half of this (6.2 million). As shown in the Table 3-13, U.S. Census and Bureau of Economic Analysis (BEA) estimates of future population indicate that New England and Massachusetts are expected to grow from 1995 to 2010, but at annual average rates that will lag the national rate.

Table 3-13
Population Forecasts (millions)
 (Source: U.S. Census, Current Population Reports, Series P25-1111, BEA projections)

	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2010</u>
United States	248.7	263.4	276.2	300.4
New England	13.2	13.6	14.0	14.8
Massachusetts	6.2	6.1	6.3	6.5

Population density is anticipated to increase. Between 1990 and 2020, counties in eastern Massachusetts are expected to increase in density, perhaps to 900 or more persons per square mile. The pattern of suburbanization and decentralization described earlier in this chapter is expected to continue; the emergence major new population centers is unlikely. Consequently, transportation facilities and services in existing corridors will need to be maintained and expanded.

More subtle population changes are also occurring. The elderly are the fastest growing component of the U.S. population. The number of persons over 65 years-of-age grew more than 20 percent between 1980 and 1990. The aging of the population and labor force will foster

additional changes to both work and non-work travel. The big change will occur when the "baby boom" generation reaches 65 years-of-age around the year 2010. The shift of population to middle-age and older cohorts with the means and time to travel suggests there will be continued strong growth in trips for medical and social purposes as well as for tourism.

Of all the New England states, Massachusetts has the largest number of jobs. It has a highly skilled workforce, is a leader in research and development of emerging technologies, and maintains strong roles in health care, financial services, and information technology. Other industries-such as plastics, textiles, industrial machinery, and tourism-cumulatively account for a significant share of state employment. Despite these strengths, continuing changes in two major industries (computers and defense), a high cost of living, and pockets of urban and rural economic disadvantage, will frame the challenges to the Commonwealth's economic future.

Over the next 25 years, employment in New England is expected to increase, but at rates lower than the national average. This is partly explained by the current restructuring of the region's economy. However, as shown in Table 3-14, per capita income in New England and Massachusetts is expected to continue to be higher than the national average.

Table 3-14
Per Capita Personal Income in Constant 1982 Dollars

(Source: U.S. Bureau of Economic Analysis and Cambridge Systematics)

	1990	2000	2010
United States	13,595	15,345	16,693
New England	16,523	18,154	19,405
Massachusetts	17,057	18,694	19,934

This is in part due to the nature of future economic expansion which will be led by growth in professional and financial services; institutional services such as hospitals, colleges, and universities; research and development; computer software; and biotechnology. The traditional effect on travel behavior is that as income rises, vehicle ownership increases, people make more trips, travel longer distances, and tend to use private vehicles. This is expected to contribute to the future estimates of increased VMT discussed earlier.

Changes in Work-Related Travel

Although work-related travel accounts for under one-third of daily travel, commuting is at the core of many transportation issues, because the demands of the morning and afternoon peak travel periods often influence transportation decisions. Each day approximately three million people commute to work in Massachusetts. Nearly half of these workers travel to jobs that are located in the Commonwealth's 25 largest cities and towns, many of which have commuter source areas extending over significant portion of Massachusetts and into nearby states.

In 1990, the predominant mode of travel-to-work for Massachusetts workers was the private automobile. As shown on Table 3-15, about 72% of the Commonwealth's work force drove alone to work in 1990, up from 61% in 1980. Carpooling and vanpooling decreased from 19% in 1980 to only about 11% of the market in 1990. Consequently, average vehicle occupancy decreased from 1.15 persons per vehicle in 1980 to 1.14 in 1990.

Table 3-15
Journey-to-Work Statistics: 1990 Mode Share
(Source: U.S. Census)

Mode	Percent of total
Drive alone	72.0
Car/van pool	11.0
Walk	5.0
Rapid transit	3.6
Bus	3.5
Work at home	2.5
Railroad	1.0
Taxi, ferry, other	1.0
Bicycle	0.4

Evidence suggests that commuting distances increased during the same time period. In 1980, the average commuting distance was estimated to be xxxx; in 1990 it was estimated to be 12 miles. This may be attributed to the increasing suburbanization of Massachusetts: in 1980, 31% of the workforce worked outside their county of residence; in 1990 34% worked outside their county of residence.

Even though travel distance have increased, commuting times have generally not increased proportionately. The average commuting time for all residents of the state increased slightly from 21.4 minutes in 1980 to 22.7 minutes in 1990. Commuting times in urban areas are somewhat longer than the average (24-25 minutes) while trips in rural areas are somewhat shorter (18-20 minutes on average). Average travel time to work varied from about 22 minutes for those driving alone, to over 40 minutes for workers traveling by vanpool or ferry.

Changes in Transportation and Information Management Technologies

In the early part of the century, most long distance freight and passenger movement occurred by rail, supplemented by barges and steamships. Immediately after World War II, automobiles, trucks and intercity bus service attained a major role, aided in part by extensive expansion and upgrading of the road network. In the fifties and sixties, the automobile assumed a large share of the market from both commuter rail and rapid transit in the Boston region, and virtually the entire market in other parts of the state. In the 1970s, air travel emerged as a popular mode of transportation for business and recreation trips, while the automobile continued to be attractive to a growing number of commuters.

In the late 1980s and 1990s, intermodalism has come of age, emphasizing the value of a balanced, efficient transportation system. Freight movement is now viewed more systematically, with partnerships developing among rail, port, and trucking interests. Both the General Agreement on Tariffs and Trade (GATT) and the North American Free-Trade Agreement (NAFTA) underline the opportunities and challenges for goods movement that will be facing the state in coming years. Spurred on by a concept of Boston as the "Capital of the Atlantic Rim," the 1990s will continue to see our highway, rail, airport, and seaport facilities improved so that the Commonwealth remains competitive in domestic and international markets.

In addition to physical infrastructure, the new emphasis on intermodalism relies on information and logistics management, which transforms decisions from being simply a modal choice based primarily on price, to a choice based on delivery time and reliability as well. If the pace of technological development continues in railroad infrastructure, intermodal cars, containers, trailers, and information technologies, the result will be a transportation matrix, similar to those operated by electric and telecommunication utilities. This would allow shipping routes to be re-directed in a matter of hours, utilizing the most effective combination of modes.

Technologies such as automated traveler information systems and automated vehicle identification systems at toll plazas are expected to offer new ways of addressing congestion and air quality problems without adding new capacity. The assorted technologies and services that comprise these intelligent systems will provide travelers with information on travel conditions, routing, and safety. This will improve the operational efficiency of highway travel.

As the national and Massachusetts economies evolve, new forms of travel and transportation will be defined. For example, telecommuting, although still a minuscule part of daily work activities, has grown dramatically. Telecommuting is the term used to define the activity of working at home or not traveling to the traditional workplace on a daily basis. Devices such as facsimile machines, computer modems, and cellular phones can, in some circumstances, be used as substitutes for travel. From 1980 to 1990, the absolute number of people working at home grew from 38,700 to 75,000, an increase of 93%. By allowing employees to work out of their homes or remote locations, peak period vehicle travel can be reduced, thereby reducing both energy consumption and emissions of pollutants.

A related phenomenon is the "transportation" of information. It is far easier and less expensive to move data along a corridor than it is to move a vehicle or a person along that same corridor. Recently, the Massachusetts Turnpike Authority and the Commonwealth reached an agreement which allows public sector agencies and institutions to take advantage of the turnpike's state-of-the-art fiber optic telecommunications network. The Massachusetts Highway Department is also investigating use of its right-of-way for this purpose. This agreement will allow the transformation of the way information is communicated within the Turnpike Authority and by the public-sector throughout the Commonwealth. The system begins at the Sumner and Callahan Tunnels in East Boston and extends along the Massachusetts Turnpike corridor to Westfield. The turnpike authority will invest over \$5.5 million in its fiber optic network, which is expected to be fully operational in 1995.

IMPLICATIONS FOR THE FUTURE

New industries and services emerge in response to opportunities and a changing marketplace; travel patterns change. The trend towards a service economy suggests that it will be important to maintain and expand our transportation system to enhance the Commonwealth's competitive advantage and lead to improved productivity and long-term job growth.

As this chapter has demonstrated, the Commonwealth's economy and the quality of life of its citizens depends on an efficient, effective, and coordinated multimodal transportation system. A truly intermodal transportation system that offers travelers and businesses choices for moving people and goods will play an important role in helping businesses to remain competitive, expand into new markets, and achieve more robust growth rates. An efficient transportation system is inherently more productive, and more responsive to new demands. An effective system helps ensure adequate levels of mobility and accessibility for freight movement and personal travel. And a coordinated system will provide for smooth and seamless transfers between modes. The ultimate objective is to strengthen the Commonwealth's ability to compete in domestic and international markets while effectively serving the day-to-day travel needs of its residents.

CHAPTER 4

REGULATORY FRAMEWORK FOR TRANSPORTATION PLANNING

The basics of the transportation planning process have changed little over the past thirty years. Yet, in subtle ways it has continually evolved in response to changing issues, conditions, and values. This evolution reflects a greater understanding of the increasing diversity of transportation needs.

Although *Accessing the Future* was developed within the regulatory framework of ISTEA, it reflects many years of comprehensive transportation planning on the national, statewide, and regional level. The ISTEA legislation was not the first time the federal government mandated a cooperative approach to statewide and regional transportation planning; in fact, as far back as 1962, the Federal-Aid Highway Act required that highway planning be the product of a comprehensive process in each urban area. Since then, the United States Department of Transportation (U.S. DOT) has only approved those highway and transit projects in urbanized areas where such projects were developed using the so-called "3C" planning process: continuing, in that constant reviews and modifications are needed to meet changing issues and objectives; comprehensive, in that the process must consider all modes of transportation, regional development plans, as well as all impacts regarding land use, economic, social, and environmental concerns; cooperative, in that an interactive relationship among federal, state, regional, and local participants must be utilized to ensure that needs are met and policies are carried out by the states and local communities.

Based on the foundations of the "3C" process, ISTEA introduced a mixture of new and continuing programs which involve more extensive transportation systems planning, programming, and management. The principles of ISTEA are stated in its Declaration of Policy:

"It is the policy of the United States to develop a National Intermodal Transportation System that is economically efficient and environmentally sound, provides the foundation for the nation to compete in the global economy, and will move people and goods in an energy efficient manner."

To implement ISTEA, the U.S. DOT promulgated two federal rules — the Statewide and Metropolitan Planning Rule and the Management and the Monitoring Systems Interim Final Rule — that apply to all state transportation agencies, all metropolitan planning organizations serving urbanized areas, and all publicly-operated transit agencies. These rules translate the policies of ISTEA into specific requirements that relate to

- greater flexibility for state and local governments to transfer funds between modes, allowing state and local officials to choose the best mix of projects without being constrained by overly rigid federal funding categories or different matching ratios which favor one mode over another;
- additional funding for a broad range of activities that contributes to attainment of air quality standards;

- increased statewide planning initiatives such as the requirement to complete this statewide transportation plan;
- an expanded role for metropolitan planning organizations (MPOs) in the transportation planning process;
- increased citizen input in transportation planning and programming by means of an ongoing and proactive public participation process;
- shifting some transportation responsibilities to private sector entities;
- an increased focus on a comprehensive approach to freight facilities and movement; and
- attention to effective maintenance and management of the state's existing transportation investments.

ISTEA and its federal rules, however, are not the only regulations that provide the current framework for transportation planning and programming. This chapter, in addition to describing the ISTEA rules in more detail, summarizes other federal and state regulations that affect transportation planning and implementation:

- Clean Air Act Amendments of 1990
- National Environmental Policy Act
- Massachusetts Environmental Policy Act
- Federal Coastal Zone Management Act/Amendments
- Energy Policy Act of 1992
- Massachusetts Energy Plan of 1993
- Americans with Disabilities Act of 1990
- Civil Rights Act of 1964
- National Transportation System Initiative

STATEWIDE AND METROPOLITAN PLANNING RULE

(Federal Regulations 23 CFR Part 450.208-336 and 49 CFR Part 613 Subpart A&B)

The planning rules promulgate a two-tiered approach to transportation planning by creating new, somewhat parallel statewide and metropolitan planning requirements regarding public participation, coordination of activities, factors to be considered in the planning process, and development of transportation plans and programs.

Public Participation

The planning rules require that all statewide and metropolitan planning efforts be conducted as part of a proactive and ongoing public participation process. States and Metropolitan Planning Organizations (MPOs) are required to provide complete public information, timely public notice, full public access to key decisions, and opportunities for early and continuing involvement, including a process for seeking out and considering the needs of those traditionally underserved by the existing transportation system. Also, periodic reviews of the effectiveness of the public involvement process must be conducted.

The Statewide Transportation Planning Process

Each state is required to carry out a continuing, comprehensive, and intermodal transportation planning process that facilitates the efficient and economic movement of people and goods in all areas of the state. In general, the statewide transportation planning process must

include, at a minimum, means of data collection and analysis; coordination of activities with those of MPOs and other organizations; consideration of 23 statewide planning factors; development of a statewide transportation plan and a statewide transportation improvement program; and coordination of activities with the metropolitan planning process.

Statewide Transportation Planning Factors (23 CFR 450.208)

Each state in its continuing transportation planning process must explicitly consider, analyze, and reflect the following 23 factors in its planning efforts:

1. Transportation needs identified through the management systems.
2. Any federal, state, or local energy use goals, objectives, programs, or requirements.
3. Strategies for incorporating bicycle transportation facilities and pedestrian walkways.
4. International border crossings and access to ports, airports, intermodal transportation facilities, major freight distribution routes, national parks, recreational and scenic areas, monuments and historic sites, and military installations.
5. Transportation needs of non-metropolitan areas.
6. Metropolitan area plans.
7. Connectivity of metropolitan planning areas within the state and between metropolitan planning areas in other states.
8. Recreational travel and tourism.
9. Any state plan developed pursuant to the Federal Water Pollution Control Act.
10. Transportation systems management and investment strategies for fostering efficient use of existing facilities.
11. Overall social, economic, energy, and environmental effects of transportation decisions.
12. Methods to reduce traffic congestion and to prevent future congestion.
13. Methods to expand and enhance transit ridership.
14. Effects of transportation on land use and land development.
15. Strategies for identifying and implementing transportation enhancements.
16. Innovative finance methods for projects including value capture pricing, tolls, and congestion pricing.
17. Preservation of rights-of-way for construction and future transportation projects.
18. Long-range needs of the state transportation system for the movement of persons and goods.
19. Methods to enhance efficient movement of commercial motor vehicles.
20. The use of life-cycle costs in the design and engineering of bridges, tunnels, and pavements.
21. The coordination of transportation plans and programs developed for metropolitan planning areas.
22. Investment strategies to improve adjoining state and local roads that support rural economic growth.
23. The concerns of Indian tribal governments.

The Statewide Transportation Plan (23 CFR 450.214)

By January 1, 1995, states must have identified the official statewide transportation plan for submittal and approval to the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA). The rules allow states some flexibility as to the type of plan they submit. According to the section-by-section analysis of the plan contained in the rules, "...policy-type plans would be a sufficient basis for later programs of transportation projects." States may also "include corridor level information..." in their

statewide transportation plans. In addition, the statewide transportation plan must have the following attributes:

- Be intermodal, giving consideration and provision to connections between rail, commercial motor vehicle, waterway, and aviation facilities, particularly with respect to intercity travel and the efficient movement of people and goods.
- Be reasonably consistent with other planning efforts, but cover a period of at least 20 years.
- Address bicycle transportation and pedestrian walkways and trails.
- Be coordinated with metropolitan transportation plans.
- Reference, summarize or contain any applicable short range planning studies, strategic planning and/or policy studies, transportation needs studies, etc.
- Reference, summarize, or contain information on the availability of financial and other resources needed to carry out the plan.

The statewide plan must incorporate transportation planning carried out by all state agencies and significant transportation related actions carried out by other agencies for recreation, tourism, and economic development. In developing the plan the state shall

- cooperate with the MPOs on the portion of the plan affecting metropolitan areas;
- cooperate with the Indian tribal government and the Secretary of the Interior on any portion of the plan affecting areas of the state under the jurisdiction of an Indian tribal government;
- provide for public involvement;
- provide for substantive consideration and analysis as appropriate of the 23 statewide planning factors; and
- provide for coordination as required.

Statewide Transportation Improvement Program (23 CFR 450.216)

The state must develop a Statewide Transportation Improvement Program (STIP) that lists all transportation projects proposed for funding with federal funds for a period of three years. The portion of the STIP that covers metropolitan areas must be developed in cooperation with the MPOs; in fact, each metropolitan area's Transportation Improvement Program (TIP) shall be included without modification in the STIP. The STIP is required to conform to the State Implementation Plan (SIP) for clean air; contain only projects consistent with the statewide plan; be financially constrained by year; and contain all capital and non-capital projects that will utilize federal funds, as well as all other regionally significant projects.

The Metropolitan Planning Organization Transportation Planning Process

Each designated MPO (required for each urbanized area of the state with a population of 50,000 or more) is required to have a continuing, cooperative, and comprehensive transportation planning process that results in plans and programs that consider all transportation modes and that support community development and social goals. In addition, urbanized areas with a population of 200,000 or more are required to be designated as Transportation Management Areas (TMAs), which have additional requirements related to congestion management, project selection, and certification. In general the metropolitan transportation planning process must include, at a minimum, coordination of activities with those of state and other organizations;

consideration of 15 metropolitan planning elements; development of regional transportation plans, transportation improvement programs, and unified planning work programs; utilization of the management systems; the implementation of major investment studies (MIS); and coordination of activities with the statewide planning process.

Metropolitan Planning Elements (23 CFR 450.316)

Each MPO in its continuing transportation planning process must explicitly consider, analyze, and reflect the following 15 elements in its planning efforts:

1. Preservation and efficient use of existing facilities.
2. Consistency of transportation planning with federal, state, and local energy conservation efforts.
3. Relief and prevention of congestion.
4. Effects of transportation decisions on land-use.
5. Programming of transportation enhancement activities.
6. Effects of all transportation projects within metropolitan area, without regard to funding source.
7. International border crossings and access to ports, airports, intermodal facilities, recreation etc.
8. Connectivity of roads within metropolitan areas with roads outside those areas.
9. Transportation needs identified through the use of management systems.
10. Preservation of rights-of-way for construction of future transportation projects.
11. Methods to enhance the efficient movement of freight.
12. Use of life cycle costs in the design and engineering of bridges tunnels and pavement.
13. The overall social, economic, energy, and environmental effects.
14. Methods to expand and enhance transit services and increase the use of those services.
15. Capital investments that result in increased security in transit systems.

Metropolitan Transportation Plans (23 CFR 450.322)

Each MPO must complete a metropolitan transportation plan which incorporates both the guidelines presented in the ISTEA planning rules and the 15 metropolitan planning elements. Each metropolitan transportation plan must be endorsed by the MPO and must be submitted to FHWA and FTA for approval. Metropolitan plans must be updated every three years in air quality non-attainment areas and every five years in attainment areas; plans may also be updated intermittently at the discretion of the MPO. The projects, programs, and policies contained in the metropolitan plans must conform to the SIP.

Transportation Improvement Program (23 CFR 450.324)

Each MPO, in cooperation with the state, must develop a TIP that lists all transportation projects proposed for funding with federal funds for a period of three years. The TIP is required to conform to the SIP; contain only projects consistent with the regional plan; be financially constrained by year; contain all capital and non-capital projects that will utilize federal funds, as well as all other regionally significant projects; and for each project listed, include the following descriptive material:

1. Estimated project cost.
2. Amount of federal funds proposed to be obligated during each program year.

3. First year proposed category of federal funds and sources of non-federal funds.
4. Second and third year proposed categories of federal and non-federal funds.
5. Identification of agencies responsible for carrying out each project.

The TIP may be modified at any time in a manner consistent with the procedures established for development and approval and through the use of established public involvement procedures. Once a TIP meets these requirements, the first year of the TIP constitutes an "agreed to" list of projects.

Unified Planning Work Program (23 CFR 450.314)

In areas designated as TMAs, the MPO is required to develop a Unified Planning Work Program (UPWP) in cooperation with the state and publicly-owned transit operators. The UPWP discusses the planning priorities facing the metropolitan planning area and describes all metropolitan transportation and transportation-related air quality planning activities anticipated to occur within the area during the next one- or two-year period, regardless of funding source or agency conducting such activities. The UPWP must describe who will perform the work, the schedule for completing it, and the products to be produced. Further, "in areas not designated as TMAs, the MPO...with the approval of FHWA and FTA, may prepare a simplified statement of work, in lieu of a UPWP, that describes who will perform the work and which activities will be accomplished using federal funds."

Major Investment Studies (23 CFR 450.318)

For projects of sufficient size and scope, an MIS must be undertaken to provide a thoughtful and thorough evaluation of alternative actions, social and environmental impacts, and cost effectiveness. Under the regulations, an MIS is defined as a "highway or transit improvement of substantial cost that is expected to have a significant effect on capacity, traffic flow, level of service, or mode share at the transportation corridor or sub-area scale." An MIS can be initiated by the MPO or any of the implementing agencies. The scope and the extent of each agency's role in the study will be determined cooperatively by the MPO, state transportation agencies, FHWA and the FTA, public transit operators, environmental, resource, and permit agencies, local officials, and other impacted groups or individuals.

MANAGEMENT AND MONITORING SYSTEMS INTERIM FINAL RULES (FHWA 23 CFR Parts 500 and 62; FTA 49 CFR Part 614)

To ensure that the planning process allocates resources in the most effective and efficient manner, each state, in cooperation with MPOs, must develop and implement six management systems:

1. Pavement Management System (PMS)
2. Bridge Management System (BMS)
3. Safety Management System (SMS)
4. Congestion Management System (CMS)
5. Public Transportation Facilities and Equipment Management System (PTMS)
6. Intermodal Transportation Facilities and Systems Management System (IMS)

In addition, a Traffic Monitoring System (TMS) must be developed to support management systems data needs. A management system is defined to be "...a systematic process, designed to assist decision-makers in selecting cost-effective strategies/actions to improve the efficiency and safety of, and protect the investment in, the nation's infrastructure." The results of the management systems are intended to be the development of project- and strategy-specific alternatives for addressing various transportation needs which must be considered in the creation of metropolitan and statewide transportation plans and improvement programs.

Major activities necessary to develop, establish, and implement a management and/or monitoring system, include the identification of performance measures; data collection and analysis; determination of needs; evaluation and selection of appropriate strategies/actions to address the needs; and evaluation of the effectiveness of the implemented strategies/actions. (Chapter 8 of *Accessing the Future* discusses the management systems in more detail.)

THE CLEAN AIR ACT AMENDMENTS OF 1990

(42 U.S.C. 7401 et seq, 40 CFR Parts 51 & 93))

In concert with ISTEA, the Clean Air Act Amendments (CAAA) of 1990 have had a dramatic affect on transportation planning and implementation. The Environmental Protection Agency (EPA), through promulgation of a Federal Rule entitled *Air Quality: Transportation Plans, Programs, and Projects; Federal or State Implementation Plan Conformity* (42 CFR Parts 51 and 93), requires transportation programs to conform to the SIP, which is an ongoing compilation of state strategies for meeting air quality standards. This is intended to ensure that transportation programs contribute to the attainment and maintenance of EPA's National Ambient Air Quality Standards (NAAQS) which set allowable concentrations and exposure limits for various pollutants.

In non-attainment or maintenance areas, MPOs and the U.S. DOT must make conformity determinations on metropolitan plans and TIPs before they are adopted, approved, or accepted. In effect, a regionally significant project cannot be built unless it improves air quality or can be proven not to be detrimental to air quality.

NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 (42 U.S.C. 4321 et seq)

The National Environmental Policy Act (NEPA) of 1969 presented a significant departure from prior legislation in that it enunciated for the first time a broad national policy to prevent or eliminate damage to the environment. NEPA requires all proponents of projects receiving federal money and/or exceeding certain thresholds regarding project size, scope, proponent, expected impacts, or other characteristics to determine the project's impact on the natural environment through the completion of an Environmental Impact Statement (EIS). This assures that appropriate and careful consideration is given to all environmental effects of proposed actions.

MASSACHUSETTS ENVIRONMENTAL POLICY ACT (M.G.L. c. 30, ss. 61-2H)

The Massachusetts Environmental Policy Act (MEPA) of 1972 requires all individuals, private entities, and state and municipal agencies to determine the impact on the natural

environment of certain projects or activities that meet specific thresholds as identified under MEPA Regulations. Proponents of projects subject to MEPA must submit an Environmental Notification Form (ENF) and if required, an Environmental Impact Report (EIR) to the Secretary of the Executive Office of Environmental Affairs (EOEA). The EIR must identify all practicable means and measures to avoid or minimize the environmental impacts of the proposed project. MEPA often has more stringent requirements than NEPA and as a result sometimes supersedes the NEPA requirements; the federal government, therefore, accepts a combination EIS/EIR instead of two separate documents. The entire MEPA process is required to be open to the public, ensuring that citizens are fully informed of decisions that may affect their environment and quality of life.

FEDERAL COASTAL ZONE MANAGEMENT ACT AND AMENDMENTS

(16 U.S.C. 1451 et. seq.)

The Federal Coastal Zone Management Act of 1972 (CZMA) and its 1976, 1980, and 1985 amendments, provide coastal states with the opportunity and funding to develop comprehensive management programs to review all proposed projects and actions that may affect coastal zones, regardless of funding sources, for consistency with state coastal policies. EOEAs Coastal Zone Management Unit reviews transportation projects within the established Massachusetts Coastal Zone. In addition, projects outside of the coastal zone with impacts that may affect the zone are also subject to review.

THE ENERGY POLICY ACT AND AMENDMENTS (42 U.S.C. 6201 et seq)

The goal of the Energy Policy Act of 1992 is to

"...slow the Nation's increasing dependence on imported oil over the short-term, and in the long term significantly reduce that dependence; reduce the consumption of oil in the transportation sector, and encourage the development and deployment of renewable energy resources."

The Energy Policy Act, and its 1990 and 1992 amendments, set a national goal of reducing the transportation sector's dependence on oil by 30% by the year 2020. This Act emphasizes research on and use of alternate sources and fuels including electricity, natural gas, methanol, ethanol, propane, hydrogen, and others. Beginning in 1996, 25% of all federal fleet purchases in urbanized areas must be alternatively-fueled vehicles; by 1999, 75% of fleet purchases must be alternatively-fueled vehicles.

THE MASSACHUSETTS ENERGY PLAN

The Massachusetts Energy Plan of 1993 was created by the Executive Office of Economic Affairs, Division of Energy Resources. This plan is intended to serve as a blueprint for energy-related government actions and to provide a general guide for the Commonwealth's energy community and consumers. The plan details actions and strategies that state agencies and private entities can take to promote energy efficiency while working towards a balance between economic development and environmental compatibility. Using tenets of the CAAA and the Energy Policy Act as a basis, the Massachusetts Energy Plan sets out Commonwealth goals and

strategies for improving energy efficiency by proposing the implementation of energy and cost-saving innovations. The Massachusetts Energy Plan is divided into seven focus areas:

1. Increasing overall energy efficiency.
2. Improving utility regulation.
3. Implementing least-cost strategies.
4. Diversifying energy resources.
5. Establishing public/private partnerships for innovations in business and technology.
6. Promoting efficiency and diversity in transportation energy use.
7. Mobilizing the State Energy Education Initiative.

THE AMERICANS WITH DISABILITIES ACT

(42 U.S.C. 12101 et seq)

The Americans with Disabilities Act (ADA) of 1990 provides comprehensive civil rights protection to individuals with disabilities regarding employment, public accommodations, state and local government services, and telecommunications. The stated purpose of the legislation is to:

- provide a clear and comprehensive national mandate for elimination of discrimination against individuals with disabilities;
- provide clear, strong, consistent, and enforceable standards addressing discrimination against individuals with disabilities;
- ensure that the federal government plays a central role in enforcing the standards established in the Act on behalf of individuals with disabilities; and
- invoke Congressional authority to address the major areas of discrimination faced day-to-day by people with disabilities.

Federal Regulations 49 CFR Part 37 - Transportation Services for People with Disabilities, outlines state and local roles in making services fully accessible. In addition, the Massachusetts Architectural Access Board has created accessibility design regulations currently employed in the design and restoration of all public facilities, including transportation facilities.

CIVIL RIGHTS ACT (23 U.S.C. 324) (29 U.S.C. 794)

ISTEA requires that statewide and metropolitan planning must be consistent with Title VI of the Civil Rights Act of 1964. Each state or MPO must execute a Title VI Assurance which ensures that no person shall, on the grounds of race, color, sex, national origin, or handicap, be excluded from participation in, be denied benefits of, or be otherwise subjected to discrimination under any program receiving federal assistance from the U. S. DOT.

NATIONAL TRANSPORTATION SYSTEM INITIATIVE

Federal Register Vol. 59, No. 120, June 23, 1994

In 1993 the U.S. DOT identified 159,000 miles of national highway as potentially part of the proposed National Highway System (NHS), pending approval by Congress. Building on this foundation, and based on the declaration of policy contained in ISTEA, the proposed next step

will be to develop a full National Transportation System (NTS) which will encompass all modes of transportation including those modes to be developed. It is intended that all modes be interconnected to promote goals that are important to the nation, including clean air, reduced energy consumption, and a safe, comfortable, efficient, and cost-effective transportation system. The National Transportation System initiative is still in the draft stages. State and metropolitan transportation and planning agencies await federal guidelines on selecting facilities for the NTS.

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CHAPTER 5

THE MASSACHUSETTS TRANSPORTATION PLANNING PROCESS

As described in Chapter Four, the Massachusetts transportation planning process must be conducted within a framework that is constantly evolving and changing, and one in which incorporates the requirements of ISTEA, the Clean Air Act Amendments (CAAA) of 1990, and other legislative mandates and regulations. While ISTEA and CAAA offer a wealth of new opportunities and challenges, they also require that certain activities are performed by those charged with developing transportation plans and programs. This Chapter describes these activities.

First, the Chapter lists and describes the entities responsible for performing transportation planning-related activities: federal agencies, state agencies and authorities, and regional and local organizations. Next, the Chapter summarizes the ongoing transportation planning tasks performed by these organizations in order to meet planning requirements: the products, schedules, processes, and analyses.

FEDERAL AGENCIES IN THE TRANSPORTATION PLANNING PROCESS

Several Federal agencies participate in the implementation of transportation programs. Most federal transportation functions are consolidated within the U.S. Department of Transportation and its constituent agencies, although certain transportation-related environmental functions are the responsibility of the U.S. Environmental Protection Agency.

Federal Highway Administration (FHWA) is responsible for implementation of the federal highway program. Through its Region One and Massachusetts Division Offices, FHWA assures effective implementation of ISTEA and other federal transportation regulations, and oversees the use of State Planning and Research funds.

Federal Transit Administration (FTA), formerly called the Urban Mass Transportation Administration or UMTA), is responsible for implementation of federal public transportation programs and projects. Through its Region One office, FTA reviews transit projects, and in cooperation with FHWA, assures effective implementation of ISTEA and other federal transportation regulations.

Environmental Protection Agency (EPA) is responsible for assuring implementation of the CAAA and other federal environmental regulations. EPA provides oversight (in cooperation with FHWA and FTA) regarding transportation-related environmental requirements, such as those regarding conformity with the State Implementation Plan (SIP) for clean air.

Other Federal agencies, such as Federal Aviation Administration, Federal Railroad Administration, National Passenger Railroad Corporation (Amtrak), National Highway Traffic Safety Administration, U.S. Coast Guard, and U.S. Army Corps of Engineers have interests regarding various transportation-related programs and projects.

STATE AGENCIES AND AUTHORITIES IN THE TRANSPORTATION PLANNING PROCESS

The following state agencies and authorities perform various tasks related to carrying out the continuing, comprehensive, and intermodal statewide transportation planning process.

Executive Office of Transportation and Construction (EOTC) is the cabinet-level office that develops state transportation policy and guides the activities and programs of the state transportation agencies and authorities. EOTC has direct responsibility for the Massachusetts Highway Department and the Massachusetts Aeronautics Commission, the EOTC Secretary serves as Chairperson of the Massachusetts Bay Transportation Authority, and EOTC provides policy guidance to the Massachusetts Port Authority and the Massachusetts Turnpike Authority. EOTC also chairs each of the Commonwealth's Metropolitan Planning Organizations (MPOs).

Massachusetts Highway Department (MHD) is responsible for planning, designing, constructing, operating, and maintaining state highways and bridges. MHD administers the distribution of all FHWA funds for statewide and metropolitan transportation planning.

Bureau of Transportation Planning and Development (BTPD), established by the State Legislature as division of MHD, is responsible for coordinating compliance with all state and regional transportation planning activities required by ISTEA. Recently, EOTC assumed responsibility for directing the activities of BTPD.

Governor's Highway Safety Bureau seeks to improve highway safety through education and enforcement programs, and through funding of community, regional, and non-profit organizational traffic safety programs.

Massachusetts Aeronautics Commission (MAC) is the state agency responsible for planning and coordinating the operation of all airports in the Commonwealth except military airports and those operated by Massport.

Massachusetts Bay Transportation Authority (MBTA) is the state authority responsible for planning, constructing, and operating public transportation services in Eastern Massachusetts, as well the Commonwealth's commuter rail services.

Massachusetts Port Authority (Massport) is the state authority responsible for planning, constructing, and operating transportation and related facilities necessary for the development and improvement of commerce in the greater Boston metropolitan area. Massport owns and operates the Port of Boston (including Conley and Moran terminals), Logan International and Hanscom airports, and the Tobin Bridge.

Massachusetts Turnpike Authority (MTA) is the state authority that owns and operates the Massachusetts Turnpike.

Executive Office of Environmental Affairs (EOEA) is the cabinet-level agency that conducts comprehensive planning for and coordination of activities and programs of the state environmental agencies. The Department of Environmental Protection, a division of EOEA, is the designated state air agency.

Other state agencies and authorities, such as the Executive Office of Economic Affairs, Executive Office of Public Safety, Massachusetts State Police, and Registry of Motor Vehicles have varying responsibilities and involvement in the transportation planning process.

REGIONAL AND LOCAL ORGANIZATIONS INVOLVED IN TRANSPORTATION PLANNING PROCESS

In Massachusetts, regional organizations play an important role in the development and implementation of transportation plans and programs. All cities and towns are represented by one of thirteen comprehensive Regional Planning Agencies (RPAs), shown on Figure 5-1, and listed in Appendix A. Local elected officials, or their designees, from member communities serve on a commission that oversees the policies, programs, and operations of the RPA. In general, the RPAs provide regional coordination services regarding a variety of comprehensive planning issues such as transportation, land use, zoning, housing, and the environment, and provide technical assistance to member communities. The RPA transportation programs are funded primarily by federal planning (PL) funds which total approximately one percent of the annual federal highway capital funds, and Section 8 federal transit planning funds.

Massachusetts also has fifteen Regional Transit Authorities (RTAs) that provide public transportation services in their designated service areas, as described in Chapter 3, and listed in Appendix B. (Service in the metropolitan Boston area, is provided by the MBTA, a state authority.) In general, Massachusetts RTAs are independent public authorities. Local elected officials, or their designees, from each of the communities in the RTA service area serve on a Board that oversees the RTA's policies, programs, and operations. In general, the RTAs are precluded by their enabling legislation (Massachusetts General Code Section 161B) from directly operating any transportation services; instead, they contract with private providers for all fixed route, demand responsive, and paratransit services. (Among the RTAs, only the Greenfield-Montague Transportation Area, serving parts of Franklin County, operates its own services.)

The RPAs and RTAs play an important role in the development and implementation of transportation policies, plans, and programs through their membership in the Commonwealth's Metropolitan Planning Organizations (MPOs). The MPOs are charged with conducting the continuing, cooperative, and comprehensive metropolitan transportation process, as defined in ISTEA, i.e., the development of regional transportation plans and programs.

As shown on Figure 5-2, Massachusetts MPOs are comprised (at a minimum) of four agencies: EOTC, the Commonwealth's lead transportation policy agency (and MPO Chair); the RPA, representing regional and local interests; MHD, the primary highway transportation provider; and the RTA, the regional public transportation provider. Two Massachusetts MPOs have more than four members: the Southeastern Massachusetts MPO, which has five members (EOTC, RPA, MHD, and two RTAs); and the Boston MPO, which has six members (EOTC, RPA, MHD, MBTA, Massport, and the MBTA Advisory Board). In addition, the Boston MPO directs the Central Transportation Planning Staff (CTPS) which provides transportation planning technical and policy support to the Boston MPO and its member agencies.

The roles of the MPO member agencies in conducting the regional transportation planning process are defined in a region-specific Memorandum of Understanding. Ten of the thirteen Massachusetts planning regions meet the population criteria for establishment of MPOs:

Figure 6-1
Boundaries of the Regional Planning Associations

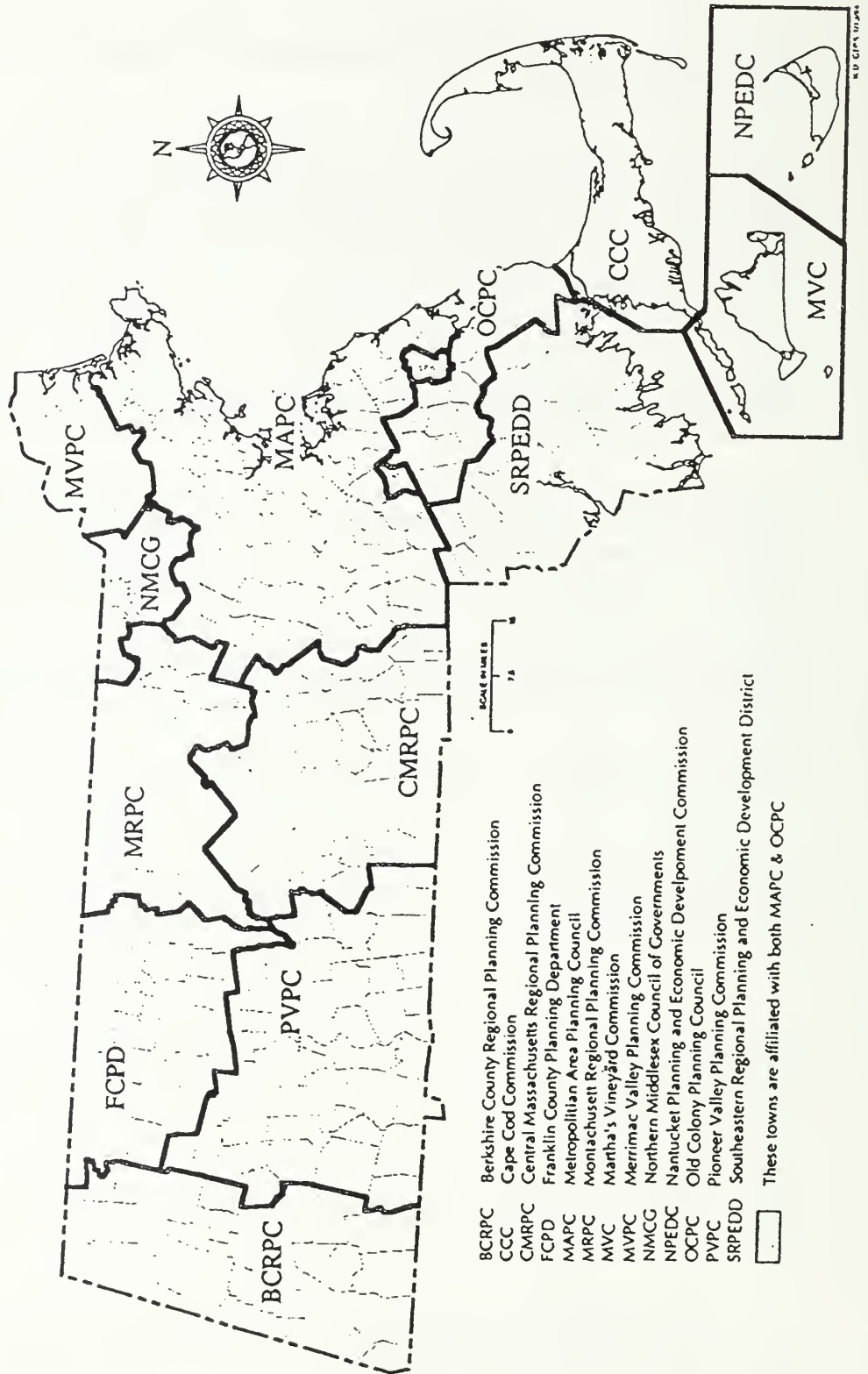
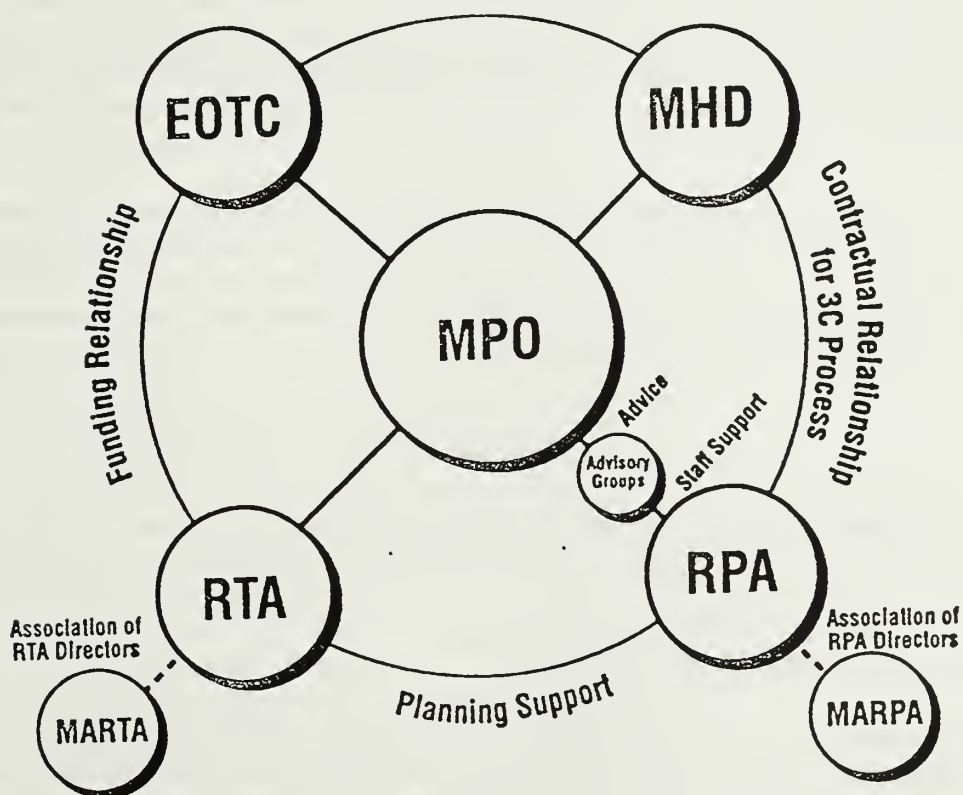


Figure 5-2
Typical Massachusetts MPO Organizational Structure



- Berkshire County
- Boston
- Cape Cod
- Central Massachusetts
- Merrimack Valley
- Montachusett
- Northern Middlesex
- Old Colony
- Pioneer Valley
- Southeastern Massachusetts

The other three planning regions — Franklin County, Martha's Vineyard, and Nantucket — do not meet the formal requirements for establishment of MPOs: they do not contain an urbanized area with a population of over 50,000. In these regions the RPA performs MPO-like functions, by mutual agreement and in cooperation with the RTA and the state transportation agencies. (Because the non-MPO planning regions generally conform to MPO requirements, subsequent references to "MPO agencies" may be thought of as a reference to EOTC, MHD, RPA, and RTA in the non-MPO planning regions.) A list of each MPO's member agencies is included as Plan Appendix C.

Five Massachusetts planning regions — Boston, Central Massachusetts, Pioneer Valley, Southeastern Massachusetts, and Merrimack Valley — are designated as Transportation Management Areas (TMAs) because they encompass urbanized areas with a population of over 200,000. TMAs must conform to special ISTEA requirements regarding congestion management systems, project selection, and certification.

IMPLEMENTATION OF THE TRANSPORTATION PLANNING PROCESS

The following sections describes the ongoing transportation planning activities that are performed by these organizations in order to meet planning requirements.

Transportation Planning Work Programs

Each Massachusetts planning region annually prepares a Unified Planning Work Program (UPWP) that defines the transportation planning activities that will be conducted by the MPO agencies and other public entities in the region. The UPWP identifies and describes all regional transportation planning activities to be undertaken within the planning region during the ensuing year. The UPWPs cover different 12-month periods in each region, although most approximately coincide with the federal fiscal year (November 1 to October 31).

Even though the UPWP is the product of the combined efforts of the MPO agencies (with input from regional communities), the RPA typically is assigned responsibility for coordinating input to the UPWP, preparing the UPWP document, and coordinating the review process. First a circulation draft is developed and submitted to the MPO agencies for approval. After MPO-agency approval, the draft UPWP is submitted to the regional transportation advisory group for review and comment. Comments are addressed by the RPA and the other MPO agencies, and any resulting modifications are then resubmitted and discussed with the regional transportation advisory group (TAG). The TAG-approved draft UPWP is then submitted to the federal agencies for review and comment; if necessary, additional modifications are made. Finally, the final-draft document is approved by the TAG, and submitted to each of the MPO agencies for endorsement; the final UPWP is then available for public distribution.

The Commonwealth also prepares an annual transportation planning work program. BTPD is required to develop (for each calendar year) the State Planning and Research (SPR) Work Program, which lists and describes the major planning activities to be carried out by BTPD and other recipients of SPR funds. The document is divided into three sections: (1) BTPD Planning Activities; (2) MHD Planning Activities; and, (3) Separate Federal-aid Agreements, which provide SPR funding for special studies/projects performed by others. These separate federal-aid agreements are provided for information only and are not considered part of the work program itself.

Transportation Plans

In November 1993, Regional Transportation Plans (RTPs) were adopted by all 13 Massachusetts planning regions. (These plans are summarized in *Accessing the Future* Chapter 9.) These regional plans were developed by the RPAs in coordination with the other MPO agencies, with substantial public input. Each regional plan summarizes regional transportation goals and objectives, describes the regional transportation system and existing conditions, identifies current and potential problems and salient issues, evaluates alternative courses of action, and recommends short- and long-term strategies and actions.

The November 1993 regional plans were determined to be in conformance with the State Implementation Plan for clean air, although conformity must be re-determined as conditions change. It should be noted that regional plans must be updated at least every three years, although the plans may be amended or updated as required.

BTPD was charged with coordinating the development of this Statewide Transportation Plan, *Accessing the Future*. The Plan development process was overseen by an Executive Steering Committee comprised of representatives of federal, state, and local agencies and authorities with transportation interests. *Accessing the Future* was produced primarily by BTPD with assistance provided by the Boston MPO Central Transportation Planning Staff, Cambridge Systematics Inc., and Howard/Stein-Hudson Associates. In addition, other agencies were asked to provide assistance with chapters related to their specific areas of expertise.

The first draft of *Accessing the Future* was released for public review in October 1994, although some draft sections of the Plan, primarily the Policies, Goals, and Objectives, were released for public review as they were developed. Numerous comments on the October Draft Plan were received; these comments were evaluated, and the Plan modified accordingly to reflect public views. (Appendix D presents a summary of the public involvement process for *Accessing the Future*.)

Transportation Improvement Programs

Every year, each region must prepare a Transportation Improvement Program (TIP), a staged three-year program of capital improvements to the regional transportation system. The TIP must be consistent with the RTP, financially constrained by year, and must include an annual element of projects to be completed in the first year of the TIP.

Development of regional TIPs is a cooperative effort that involves the MPO agencies, regional communities, the regional TAG, and the general public. The process must consider

regional and MPO-agency policy, federal regulations, state and local needs, environmental policy, land use and economic development issues, and other related issues.

Typically, the TIP development process is managed by the RPA, in cooperation with the MPO agencies. The process may take several months; because the TIP must be in place by the October 1, the TIP development process is usually begun in late winter or early spring. The usual milestones are as follows:

- Public announcement of TIP development process.
- Solicitation of proposed projects from local communities and MPO agencies.
- Review of proposed projects for conformity with Regional Transportation Plan.
- Preparation of preliminary draft TIP.
- Review by EOTC Capital Expenditures and Program Office.
- Public review through TAG.
- Endorsement by MPO agencies and approval by Governor (or designee).
- Review by federal agencies.

It should be noted that CAAA Air Quality Conformity Regulations require that the TIP demonstrate conformity with the SIP (conformity is discussed in more detail in following sections).

Every two years, a State Transportation Improvement Program (STIP) must be developed. By definition, all regional TIPs shall be included without modification in the STIP. As a result, the STIP project priorities directly reflect the priorities of each TIP, and therefore the transportation project priorities of each region. And because each regional TIP must conform to the SIP, by definition the STIP is in conformance.

Air Quality Conformity

The Commonwealth of Massachusetts is classified as serious nonattainment for ozone and is divided into two nonattainment areas: the Eastern Massachusetts ozone nonattainment area comprised of Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Suffolk, and Worcester counties; and the Western Massachusetts ozone nonattainment area comprised of Berkshire, Franklin, Hampden, and Hampshire counties. In addition, the communities of Boston, Cambridge, Chelsea, Everett, Malden, Medford, Quincy, Revere, and Somerville are in moderate nonattainment for carbon monoxide (CO), and the communities of Lowell, Waltham, Worcester, and Springfield are designated as "unclassified" nonattainment areas for CO. Because of the ozone nonattainment designation, the Commonwealth is required by the CAAA to reduce emissions of volatile organic compounds (VOCs) and nitrogen oxides (NOx), the two major precursors to ozone formation, in order to achieve attainment of the ozone standard by 1999; and, because of the CO nonattainment and unclassified designations, the Commonwealth is required to achieve CO attainment by 1995.

The Massachusetts Department of Environmental Protection (DEP) is responsible for developing and periodically updating the CAAA-required Massachusetts SIP. The SIP is a program of activities whose purpose is the elimination or reduction in severity and number of violations of the National Ambient Air Quality Standards (NAAQS) and the achievement of expeditious attainment of the standards. DEP's latest SIP submissions include a program of strategies that will show reasonable further progress toward attainment of the NAAQS for ozone

in 1999. A large number of SIP programs target transportation-related sources, including an enhanced inspection and maintenance program, reformulated gasoline, the California Low Emissions Vehicle Program, and the Tier I Federal Vehicle Standards. The latest SIP submission also contained a VOC emission budget for 1996 and 1999 and each year thereafter as well as a NOx emission budget for 1999 and each year thereafter. These budgets are based upon transportation-related data provided by the BTPD: current and future daily vehicle miles of travel (DVMT) and travel speed by functional classification for each county within the state. In addition, BTPD calculates statewide monthly, daily, and hourly variation in traffic to result in the statewide DVMT mix by vehicle classification for each functional classification of roadway.

Planning regions within nonattainment areas are required to perform conformity determinations prior to the approval of their Regional Transportation Plans and Transportation Improvement Programs. Section 176 of the CAAA defines conformity to mean conformity to the SIP's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of the standards. Each region must certify that all activities outlined in their regional plan and TIP will not

- cause or contribute to any new violation of any standard in any area;
- increase the frequency or severity of any existing violation of any standard in any area; and
- delay the timely attainment of any standard or any required interim emission reductions or other milestones in any area.

Each region must conduct an air quality analysis of their transportation plan and TIP. The procedures and assumptions used in these analyses must be prepared in accordance with both the EPA's and DEP's final conformity regulations and must be consistent with procedures used by DEP to develop the Massachusetts 1990 Base Year Emission Inventory, the 1996 Reasonable Further Progress Plan, and the Post 1996 Reasonable Further Progress Plan for the SIP. To conduct these analyses, the RPAs utilize travel demand models that forecast future travel activity and speeds to predict the air quality impacts of various transportation projects. EOTC provides the RPAs with emission rates, analysis tools, and other technical guidance to assist them with their analyses. In addition, certain procedures must be followed, including consultation meetings with the FHWA, FTA, EPA, DEP, EOTC, and the RPAs.

After each RPA develops regional emissions estimates, BTPD combines the regional estimates to develop Eastern and Western nonattainment area emissions estimates to show conformity with the SIP. For those regions containing CO nonattainment areas, analyses are performed to demonstrate that the emissions in the Action scenarios are less than both the Baseline scenarios for all analysis years and the 1990 base year emissions. These CO analyses are conducted by the following RPAs:

- Central Massachusetts Regional Planning Commission: Worcester.
- Metropolitan Area Planning Council: Boston, Cambridge, Chelsea, Everett, Malden, Medford, Quincy, Revere, Somerville, and Waltham.
- Northern Middlesex Council of Governments: Lowell.
- Pioneer Valley Planning Commission: Springfield.

Management and Monitoring Systems

As described in Chapter 8, Massachusetts has implemented a hierarchical approach to management systems development. Each management system is being developed and implemented by a technical team composed of representatives of federal, state, and regional transportation agencies. The activities of the technical teams are guided and coordinated by a Technical Coordinating Committee comprised of the technical team leaders and representatives of implementing agencies.

Corridor and Major Investment Studies

Historically, corridor studies have been conducted by state and regional transportation agencies to evaluate alternative strategies to address needs that have been identified in the planning process. Corridor studies may be initiated by any of the MPO agencies, or one or more affected communities in cooperation with the RPA. The studies are usually conducted by the initiating agency (sometimes with consultant assistance) in cooperation with the other MPO agencies and other agencies as appropriate. Often a Citizen Advisory Committee is formed to allow public input regarding the conduct of the study.

Corridor studies often serve as precursors to the environmental review process, and recommended projects that are the result of corridor studies are candidates for inclusion in the regional transportation plan. Based on past experience, corridor studies have been found to be an effective means of forging consensus on multi-jurisdictional transportation problems and of providing a sound basis for future project implementation.

Studies of alternatives of sufficient size and scope must conform to ISTEA requirements regarding major investment studies (MIS). The scope and the extent of each agency's role in an MIS is determined by the MPO agencies, other state transportation agencies, FHWA, FTA, environmental, resource, and permit agencies, local officials, and other impacted groups.

Public Participation

Although they have fostered extensive public participation for many years, the RPAs, in response to ISTEA, have enhanced their efforts to provide proactive and inclusive participation in the MPO process. Each RPA, as part of the MPO, has recently adopted and published a public participation plan that summarizes the activities that the RPA and MPO agencies will utilize to ensure adequate involvement in the development of transportation policies, plans, and programs. These public participation plans provide for timely public information, access to key decisions, and outreach efforts to those traditionally underserved by the existing transportation system.

The RPAs utilize a variety of strategies to foster public involvement on transportation decision-making. All of the regions have TAGs whose members include elected and appointed officials. The TAGs serve in an advisory capacity to the MPOs and perform the following functions:

- Review and approve federally-mandated documents including the UPWP, TIP, and the Regional Transportation Plan.
- Conduct regularly scheduled meetings open to the public to discuss timely regional transportation issues.
- Sponsor periodic presentations from either the MPO members or state transportation officials.
- Provide information and status reports on specific planning efforts of the MPO.

The regions also implement project-specific Corridor Advisory Committees, as needed, as well as issue-specific advisory committees. A variety of mechanisms, such as newsletters, press releases, and brochures, are utilized by RPAs to inform the public of transportation planning activities and to solicit participation. Highly innovative strategies, such as the use of cable television and Computer Aided Real-time Translation, are also being explored to provide increased access and levels of participation.

The State transportation agencies utilize the regional public participation processes to the maximum extent in order to provide information and to solicit public involvement in the development of statewide policies, plans, and programs. In addition, State agencies also employ strategies that target particular constituencies and interest groups to ensure their input to planning efforts. For example, many project-specific advisory groups have been utilized, and special public involvement efforts are utilized for large-scale projects: the public outreach process for the Central Artery/Third Harbor Tunnel Project is unprecedented in its magnitude and scope. Also, several specialized statewide transportation advisory committees have been formed, including the Freight Advisory Council, the Massachusetts Bicycle Advisory Board, and the Commercial Vehicle Operations Steering Committee; additional statewide advisory groups are planned.

A special effort was developed to ensure public involvement in the development of *Accessing the Future*. As summarized in Appendix D, this process was statewide in scope, and built on the existing regional public participation processes.

Coordination with Other States

Transportation planning in Massachusetts must be integrally tied to the planning efforts of other states. The need for better interstate connections is a basic tenet of ISTEA and is further intensified by the CAAA air quality conformity requirements, compelling states to coordinate their air quality control efforts. Indeed, three Massachusetts planning regions (Merrimack Valley, Southeastern Massachusetts, and Pioneer Valley) share urbanized areas with adjoining states, requiring them to consult with MPOs in those states as part of their planning processes. In addition, Massachusetts participates in special interstate groups whose role is to assist with long range planning goals, including, among others, the Coalition of New England Governors, the I-95 Corridor Coalition, the New England Transportation Initiative, and the Connecticut River Valley Scenic Byways Program.

CHAPTER 6

ENVIRONMENTAL QUALITY AND TRANSPORTATION

Recognizing the relationship between transportation infrastructure and the natural environment, ISTEA established a broad policy requiring decision makers to guide transportation planning so that these two important areas of concern conflict as little as possible and that they enhance each other where feasible.

Federal transportation agencies have acted on this new policy by adopting procedures to implement ISTEA's environmental objectives. For example, the Federal Highway Administration (FHWA) is integrating environmental considerations more fully into its decision-making process. Although federal highway planning and project development have explicitly dealt with environmental issues for the past 25 years under the National Environmental Policy Act, the Clean Air Act, the Clean Water Act, and other laws, environmental objectives and programs are now an integral part of federal transportation legislation. This integration is significant for state and regional transportation planning and programming which must conform to federal planning guidelines because the bulk of transportation funding for most major projects comes from federal sources.

In producing *Accessing the Future*, Massachusetts recognizes the need to follow through on long-standing commitments to integrate environmental, economic development, energy conservation, and transportation improvements to enhance the quality of life for all citizens of Massachusetts. To achieve these goals, the Executive Office of Transportation and Construction will seek to avoid environmental impacts where possible, to minimize and mitigate the extent of impacts that are unavoidable, and to enhance the environment through transportation programs and projects where feasible.

MEETING THE CHALLENGE

In the past, there sometimes was an assumption that transportation improvement projects and environmental protection were in conflict. To transportation officials, environmentalists often stood in the way of improvements that were intended to increase safety, enhance personal mobility, and stimulate economic development. To environmentalists, transportation projects, particularly new highways, were often the cause of environmental degradation resulting in loss of wildlife habitat losses, water pollution, toxic emissions, and soil erosion. Fortunately, much has changed since then:

- Transportation agencies have added environmental policy staff and technical analysts to integrate environmental objectives into policies and plans as well as into project design.
- Environmental values are ensured throughout a project's lifetime by recent modifications in design manuals and new management practices.
- Alternatives analysis based on comparative costs and benefits is far more sophisticated and accurate.

A genuine shift in attitudes on the part of transportation officials has resulted in environmental values being woven into the transportation agenda. This attitude shift is a crucial factor in meeting the challenge of serving the future transportation needs of the public while protecting the natural environment and enhancing the quality of life in the Commonwealth.

CLEAN AIR

The Clean Air Act of 1970 and its 1990 amendments form the basis of the federal air pollution control program, covering air pollution from virtually all sources. This legislation has profound implications for transportation policies, plans, programs, and projects, particularly in those areas where air quality has failed to meet the National Ambient Air Quality Standards. In Massachusetts, the Governor declared the entire state to be in "serious" non-attainment, even though some parts of the state were only "moderately" in non-attainment. This decision allowed the Commonwealth to address the achievement of attainment in a uniform manner

Air quality issues are addressed through the development of the State Implementation Plan (SIP) for clean air, the preparation of a statewide emissions budget for transportation, and the computer modeling of air quality impacts of projects. All transportation plans, programs, and projects must conform the SIP to ensure that they improve or, at a minimum, do not degrade air quality. To achieve air quality objectives, Massachusetts is pursuing the following initiatives and programs:

- High-Occupancy Vehicle Program.
- Central Artery and Third Harbor Tunnel Project.
- Alternative Fuels Working Group and support for Alternative Fuel Vehicle Program.
- Expansion of Commuter Rail.
- Expansion of Park and Ride.
- Ridesharing Agency and Transportation Management Association support.
- Transit subsidies.
- Congestion Management and Air Quality Program.

CLEAN WATER

Water quality protection policies and practices have been established to ensure compliance with the federal Clean Water Act, Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990, the Massachusetts Environmental Policy Act, Coastal Zone Management Consistency Review, and Chapter 91 of the Massachusetts General Laws. These laws, and the regulations, procedures, and practices derived from them, serve to protect the state's water resources, including the preservation of public and private water supplies, protection of wildlife and plant habitats, and the preservation of waterways for recreational use.

Wetlands Protection

Coastal and inland wetlands have been protected for 30 years in Massachusetts through the administration and enforcement of several state laws, including the Wetlands Protection Act (MGL c. 131 §40). Because wetlands protection is important to the preservation of wildlife and plant habitats, protection of public and private water supplies, and flood prevention and attenuation, state transportation agencies have developed policies and practices designed to

comply with these laws. A central principle being observed in Massachusetts is that no net loss of wetlands shall occur as a result of transportation projects. For example, the Massachusetts Aeronautics Commission has prepared a Generic Environmental Impact Report, approved by the Secretary of Environmental Affairs, that governs the management and control of vegetation growing in wetland areas that could create safety hazards for aviation activity.

New initiatives that are planned or underway include the development of best management practices for drainage work and wetlands replication. The Massachusetts Highway Department (MHD) is also participating in a multi-agency effort to establish wetlands banking, including the creation of a mechanism for trading credits for the creation of wetland areas in excess of those required for replication due to loss resulting from construction.

Coastal Non-point Pollution Control Program

States are required under the Coastal Zone Reauthorization Act Amendments of 1990 to develop Coastal Non-point Pollution Control Programs which implement management measures to control non-point source pollution by integrating the activities of federal, state, and local authorities. An example of useful collaboration engendered by this requirement is a program to protect and restore shellfish beds impacted by storm drain discharges. This program was developed jointly by the Massachusetts Bays Program, the Division of Marine Fisheries, and the U.S. Soil Conservation Service. Management measures are also being developed and incorporated in the early stages of highway project development to address issues of siting, design, chemical controls, operation and maintenance practices, and storm water control systems.

Stormwater Runoff Control

Stormwater runoff and melting snow and ice from highways and parking lots may be harmful to nearby water resources and water supplies. MHD has moved aggressively to develop policies and procedures for project design and management practices to reduce the contamination of water resources from state roadway drainage systems. In addition, MHD is incorporating new standards into its designs and specifications for construction projects to implement best management practices for attenuating pollution from highway traffic, and is devising a priority list of sites for remediation of existing systems, starting with the most sensitive locations.

Road Salt Use

MHD has taken a number of steps to limit the use of salt to control ice and snow on state highways by mixing salt with sand, by improving the calibration of spreaders, and by establishing zones where no salt or limited salt is used in order to protect groundwater aquifers. MHD's weather forecasting and monitoring system also provides improved targeting of deicing materials application. In addition, MHD has experimented with alternative deicing products in environmentally sensitive areas, although these materials are more expensive than traditional salt, and their use may be focused on areas of extreme environmental sensitivity.

Dredging Activities

Due to sedimentation that occurs over time, dredging of harbors and navigational channels is necessary to maintain adequate depths for safe movement of vessels, including the accommodation of newer and longer vessels. However, dredging inevitably causes disruption of the bottom of channels, affecting sea life and water quality in the vicinity. Also, the material

dredged sometimes contains harmful contaminants, creating a disposal problem. In general, Massachusetts requires an Environmental Impact Report to address the impacts of dredging activities. A joint federal-state review is often undertaken for significant projects, such as the proposed dredging of Boston Harbor by the U.S. Army Corps of Engineers in association with the Massachusetts Port Authority.

In summary, Massachusetts is pursuing the following clean water initiatives and programs:

- Promote best management practices for drainage work and wetlands replication.
 - Develop new and improved designs and management practices to reduce the contamination of water resources from state roadway drainage systems.
 - Continue to explore cost effective ways to reduce or limit the use of road salt without compromising public safety.
 - Assure completion of a program of testing and removal of old or leaking underground fuel storage tanks at state transportation facilities.
- Participate with the Executive Office of Environmental Affairs in the Wetlands Banking and Restoration Task Force and the Watershed Initiative.

HAZARDOUS MATERIALS AND HAZARDOUS WASTES

Transportation activities commonly involve hazardous materials. Petroleum products and other hazardous materials are transported in bulk by truck and railroad. In addition, transportation agencies use and store a variety of hazardous materials for cleaning and maintenance activities.

Due to the potential of such materials to adversely affect the health and safety of transportation workers, travelers, and the public at large, the storage and use of these substances are highly regulated and managed. Products classified as hazardous materials need to be identified, contained, labeled, and stored properly. Any resultant wastes must be properly contained, labeled, neutralized, transported, and disposed. Records of these activities must be kept, and some operations may require licensed professionals or technicians to assure that they are done properly. Reducing the use of hazardous materials will tend to result in the reduction of hazardous waste.

To address issues related to the transportation of hazardous materials, Massachusetts is pursuing the following hazardous materials initiatives and programs:

- Conduct research on materials of lower toxicity that may be substituted without undue loss of performance.
- Provide ample training and protection for transportation workers who may come into contact with hazardous materials.

LAND USE

The primary environmental issue pertaining to land use is the interaction between mobility and efficient use of natural resources. In many suburban and rural areas, mobility often necessitates automobile use because densities are too low to make public transportation feasible or effective. Land use policies that keep densities low create an environment where activities are

dispersed, causing consumption of far more land than would be the case where higher densities are allowed and encouraged. When trip origins and destinations spread farther apart, overall travel distances increase, which generally lead to increased vehicle emissions.

Massachusetts is pursuing the following land use initiatives and programs:

- Promote incentive-based programs for ridesharing and parking management.
- Utilize traffic mitigation measures in state environmental reviews and approvals (for example Section 61 Findings) to support alternative travel modes, such as walking, bicycling, and public transit, in public and private development projects.

NOISE AND VIBRATION

Noise and vibration emanate from a wide variety of transportation-related sources, including vehicle engines and tires, transportation facility ventilation fans, emergency vehicle sirens, and rail and subway car wheels and brakes. Excessive noise can impair sleep, interfere with conversation, and, in extreme cases, damage hearing. Transportation facilities and vehicles constitute a substantial source of noise, particularly in urban areas.

Noise reduction is best addressed at its source. For example, new "Stage III" aircraft are far quieter than earlier models, and their increasing use is having very beneficial effects on areas close to airports. Mitigation strategies where source reduction is not feasible may be desirable and appropriate in certain other areas. Increased insulation and special windows can offer added protection to building occupants, and noise barriers along railways and busy highways can be effective in shielding nearby properties from excessive levels of sound.

Massachusetts is pursuing the following noise and vibration initiatives and programs:

- Conducting research and testing of the effectiveness of various approaches to reduce the impacts of noise and vibration, and to develop specifications for effective mitigation measures.
- Implementing appropriate noise buffers, barriers, and vibration attenuation measures based on intensity and proximity to sensitive receptors such as homes, hospitals, and schools.

ENERGY CONSERVATION

According to the *Massachusetts Energy Plan*, 32% of all energy demand in Massachusetts arises from the transportation sector. Half of all the petroleum used in Massachusetts goes into the fuel tanks of motor vehicles, aircraft, trains, and vessels. Thus, we cannot ignore the importance of energy use in transportation plans and policies.

Energy use for transportation has increased over the past fifteen years despite improvements in fuel efficiency of newer vehicles. Inexpensive gasoline, urban sprawl, growth of suburbs as major employment centers, and an increase in the number of multiple wage earners in households are factors that have led to higher levels of automobile ownership, more daily trips, and higher annual vehicle miles traveled.

Waste and inefficiency in the use of energy resources need to be addressed if the state is to avoid excessive costs for residents and businesses, sapping the spending power of individuals, and reducing the competitiveness of businesses and industries.

Alternative fuels for vehicles offer a way to achieve greater independence from foreign sources of petroleum and gain price stability due to a more diverse set of fuels. In addition, air quality will be improved, particularly for volatile organic compounds (VOC) and carbon monoxide, as the proportion of alternate-fueled motor vehicles in the state fleet rises.

Facilities management practices that seek to increase efficiency are an important energy conservation strategy. Transportation agencies own a great number and variety of properties, many of which could benefit from energy conservation improvements. Part of the Clean State Program focuses on this issue by urging agencies to conduct energy audits and make improvements that offer reasonable benefits.

In summary, Massachusetts is pursuing the following energy conservation initiatives and programs:

- Participate in the Clean Cities Program of the U.S. Department of Energy.
- Move forward in improving the energy efficiency of transportation buildings and other facilities.
- Conduct energy audits and energy conservation programs to reduce energy use in space heating and cooling, roadway lighting, and other activities.

HISTORIC PRESERVATION

Transportation agencies have an important role to play in protecting historic resources. State and federal laws and regulations require that the evaluation of transportation alternatives include estimations of environment impacts, including effects on historic resources. Since the enactment of ISTEA, the role of transportation agencies has been expanded to allow the enhancement of projects through the acquisition, restoration, or adaptive reuse of historic properties.

To protect historic resources, Massachusetts is pursuing the following initiatives and programs:

- Cooperate with the Massachusetts Historical Commission and other state and federal agencies in the development of policies, plans, programs, and projects that are consistent with broad historic preservation and enhancement objectives.
- Encourage the submission of proposals by regional planning agencies for historic preservation and improvement projects to be considered for transportation enhancement funding.
- Participate in the legislature's Special Commission on Historic Preservation.

TRANSPORTATION PROGRAMS

A number of environmental programs are operated by the Massachusetts Executive Office of Transportation and Construction in cooperation with other transportation and planning agencies.

Transportation Enhancements

ISTEA, the legislation that created the Transportation Enhancement Program, reflects a growing recognition that transportation programs must expand beyond their traditional boundaries to foster a more sensitive relationship to the environmental and physical setting in which they are located. It is the objective of the Massachusetts Transportation Enhancement Program to implement projects that support this goal. Enhancement projects should enhance or add community, environmental, scenic, or historical value to a transportation project or project area. States are required to set aside ten percent of their share of surface transportation funds for projects that serve to enhance the transportation system. Each state has flexibility, within the limits of the law, to create a program that best suits its respective needs. Ten specific categories eligible for enhancement funding have been established through federal legislation:

1. Bicycle and pedestrian facilities.
2. Preservation of abandoned railroad corridors.
3. Historic preservation.
4. Archaeological planning and research.
5. Rehabilitation and operation of historic transportation structures, including railroad facilities.
6. Acquisition of scenic and historic sites.
7. Scenic or historic highway programs.
8. Landscape construction.
9. Control and removal of outdoor advertising.
10. Mitigation of water pollution due to highway runoff.

Massachusetts has recently revised its Transportation Enhancement Guidelines in order to coordinate eligible enhancement projects and to ensure that the enhancement program selects projects of the highest quality and significance to the Commonwealth.

Open Space

Open space acquisition and enhancement activities have been conducted in conjunction with major highway projects, such as the Central Artery project in Boston and the development of a new Route 146 in Worcester and Millbury. The Commonwealth's Open Space Program focuses on the protection of scenic and natural qualities of the Commonwealth through the acquisition of scenic and environmentally important parcels along public ways. The following criteria must be met for the acquisition of open space:

- Scenic vistas from the road of either man-made or natural features of statewide or local significance.
- Location adjacent to a public right of way.
- Joint acquisition, with other agencies, based on the existence of one or more of the following attributes:
 - coastal and/or inland wetland areas;
 - aquifer recharge areas;
 - agricultural land;
 - land containing rare and endangered plants, animals or ecosystems;
 - rare or unique geological features;
 - historic structure, landscapes, archaeological sites, or other special features.

- Provision of a maintenance and management plan must be provided by a conservation commission, local group, or state agency.
- Accessible to the public where consistent with highway safety.

Massachusetts is pursuing the following open space initiatives and programs:

- Acquire, through various funding mechanisms, transportation-related sites that satisfy open space criteria.
- Work cooperatively with other state agencies in further development of the Open Space Program.

Scenic Byways

The Scenic Byways Program protects and promotes designated roads or highways within the Commonwealth that meet established criteria for scenic byways designation. The program will provide official recognition to the scenic, cultural, and historic qualities of the Commonwealth's scenic highways. It will strive to preserve and enhance existing resources while generating new economic possibilities. Where appropriate, the Massachusetts Highway Department will work with the Massachusetts Office of Travel and Tourism, the Department of Environmental Management, Department of Wildlife and Fisheries, and other appropriate state agencies in implementing the program. Current Scenic Byways studies include:

- Jacob's Ladder Trail (Route 20) between Westfield and Lee.
- Old Kings Highway (Route 6A) on Cape Cod.
- Connecticut River Valley Scenic Byway Study with New Hampshire and Vermont.

Bicycle and Pedestrian Programs

Massachusetts recognizes that bicycles and pedestrians are a significant and growing component of the Commonwealth's transportation system. In addition to adding new off-road facilities to the system, the Commonwealth is also advancing a number of initiatives to make it easier, safer, and more pleasurable to travel by bicycle or by walking.

Massachusetts is pursuing the following bicycle and pedestrian initiatives and programs:

- Revise the Massachusetts Highway Design Manual to more fully incorporate state-of-the-practice bicycle and pedestrian elements.
- Develop a comprehensive system of off-street, multi-use trails that complements the roadway-based system of bike lanes and routes and sidewalks.
- Provide safe and convenient ways to transport bikes on buses, trains, ferries, and airplanes.
- Include bicycle parking facilities as a parking management strategy.
- Develop more bicycle and pedestrian facilities that support the Massachusetts tourism industry.

STATE INITIATIVES

The above federal and state programs illustrate the innovative ways in which the Commonwealth is responding to environmental concerns. The state has also pioneered programs and projects that show that Massachusetts is not only maintaining established environmental standards but also embracing ways to protect, preserve, and enhance its environment.

The Clean State Initiative

In February, 1993 Governor Weld signed Executive Order #350, which established the Clean State Initiative. The first part of this program is directed towards bringing all state agencies into compliance with state and federal environmental laws. The second part is aimed at preventing pollution and conserving natural resources. State agencies are required to report periodically on violations of environmental laws, regulations, etc., and each state secretariat is required to prepare a pollution prevention and resource conservation plan. Recommendations and initiatives in the plan produced by the Executive Office of Transportation and Construction include the following:

- Perform environmental audits and implement pollution prevention plans.
- Improve procurement practices, purchase of recycled materials, and better inventory control.
- Establish source reduction, conservation, and recycling programs.
- Improve energy and water conservation.
- Reduce air pollution.
- Minimize non-point sources of water pollution.
- Improve indoor air quality in state facilities.
- Prevent noise pollution.
- Establish environmental education programs for state personnel.
- Monitor and evaluate environmental performance of state agencies and programs.

The Massachusetts Energy Plan

The *Massachusetts Energy Plan*, published in 1993 by the Massachusetts Division of Energy Resources, sets out an ambitious array of goals and strategies designed to improve energy efficiency, decrease energy costs, and reduce dependence on unreliable energy sources. One of the five principal recommendations in the plan is to "Increase efficiency and diversity in transportation energy use." Four strategies were identified to accomplish this goal:

1. Stimulate the market for alternative fuel vehicles.
2. Encourage energy efficiency in vehicles.
3. Prioritize energy use in transportation planning and investment.
4. Initiate a comprehensive "Green Travel Employer" campaign.

The *Massachusetts Energy Plan* aims to achieve a long-term reduction in energy consumed in the movement of people and goods, increased security of supply, and effective reductions in the emissions of harmful air pollutants largely through a combination of incentives and investments. Among the results envisioned by implementation of the plan are reduced traffic congestion, improved energy efficiency, and growth of energy-related businesses in Massachusetts.

Choosing to Compete: A Statewide Strategy for Job Creation and Economic Growth

Choosing to Compete, published in 1993 by the Massachusetts Executive Office of Economic Affairs and the University of Massachusetts, is intended to serve as a blueprint for Massachusetts state government in helping to create a business environment that will lead to economic growth, innovation, and job creation. The key action category for transportation is titled "Improving the Infrastructure Base," which urges the greatest possible enhancement of the Commonwealth's competitive advantages by giving priority to projects having the most positive impact on productivity and prospects for long-term, permanent job growth. Important aspects of *Choosing to Compete* are that it recognizes that the environment is a vital asset of the state, and that economic development and transportation infrastructure development must be compatible with environmental values.

Transportation planning plays a crucial role in the protection of environmental quality by providing a link for policy-makers between established environmental laws, regulations and guidelines, and transportation related programs and projects that protect our natural resources. In this manner, the Commonwealth seeks to ensure that environmental quality is protected and enhanced.

CHAPTER 7

FINANCING OUR TRANSPORTATION SYSTEM

To accomplish the goals identified in *Accessing the Future*, state and regional transportation agencies will be required to utilize limited financial resources in an efficient and innovative manner. This chapter discusses the current methods of transportation financing and presents some alternative approaches for consideration.

First, this chapter identifies the mechanisms which state and regional transportation agencies are authorized to use for planning, maintaining, and improving the transportation systems of the Commonwealth of Massachusetts. Then, the present sources of funds are examined, and the flow of these dollars through the transportation agencies is explained. This is followed by an outline of fiscal roles and responsibilities as well as the interagency coordination that will be necessary to ensure responsible transportation improvement programming. After that, the financing methods used by other states are discussed. Finally, the financing options available within Massachusetts are identified.

TRANSPORTATION AGENCY EXPENSES

The Commonwealth of Massachusetts currently spends approximately \$3 billion a year for transportation capital and operating costs, including funds to maintain and improve the state's highways, bridges, mass transit systems, ports and airports. The majority of these funds are used by the state transportation agencies and authorities listed below.

Massachusetts Highway Department

The Massachusetts Highway Department (MHD) is responsible for the maintenance of over 3,000 centerline miles of highway, 2,900 bridges and 60,000 acres of roadside area throughout the Commonwealth. In addition, MHD oversees the distribution of funds to all of the state's cities and towns for local transportation projects. In Fiscal Year (FY) 1994, MHD spent over \$1.4 billion for transportation, approximately 65% of which was reimbursed by the federal government.

Massachusetts Bay Transportation Authority

On an average weekday 646,500 passengers rely on the Massachusetts Bay Transportation Authority (MBTA) to get them where they are going. To provide this level of service, the Authority operates an integrated multi-modal system consisting of eleven commuter rail lines, eight rapid transit lines and over 150 bus and trackless trolley lines, and provides nearly 240,000 vehicle miles of service each day. In addition, the MBTA manages or subsidizes commuter boats, as well as door-to-door paratransit service for persons with disabilities. In 1993 the MBTA spent approximately \$764 million in operating costs on mass transit, serving 130 cities and towns in Massachusetts.

Regional Transit Authorities

The Commonwealth's 15 Regional Transit Authorities (RTAs) served over 28 million riders in FY 1993 with fixed route bus service. RTA paratransit services, for persons who cannot travel on

conventional buses and trains, were used by over 2.4 million riders. In 1993 the RTAs spent \$62 million for capital and operating expenses to provide these services.

Massachusetts Turnpike Authority

The Massachusetts Turnpike Authority (MTA) oversees the 135-mile Massachusetts Turnpike, which extends from the City of Boston to the New York border, plus the Sumner and Callahan Tunnels under Boston Harbor which connect downtown Boston with Logan Airport. In 1993 the MTA spent \$156 million in order to operate and maintain this system.

Massachusetts Port Authority

The Massachusetts Port Authority (Massport) controls and operates Logan International Airport, Hanscom Field, all public marine terminals and piers in the Port of Boston, and the Tobin Memorial Bridge. Massport spent \$304 million in FY 1994 on these combined activities.

Massachusetts Aeronautics Commission

The Massachusetts Aeronautics Commission (MAC) oversees the development and operations of nearly 50 municipal and private public-use airports, seaplane bases and heliports. It administers the airport improvement programs, safety inspections and enforcement, aircraft registration, and statewide airport and heliport planning. In FY 1994 MAC expended \$17.7 million on these activities.

Other Transportation Related Agencies

In addition to the agencies and authorities listed above, several other state agencies help to maintain and operate the state's transportation system. For instance, the Metropolitan District Commission (MDC) exercises jurisdiction over 640 lane miles of roadway which connect MDC parks; the State Police are responsible for law enforcement and highway safety; and the Registry of Motor Vehicles (RMV) administers drivers' licenses and vehicles registrations.

In addition, a good deal of roadway construction and maintenance is performed by the Commonwealth's cities and towns. Most of this local road work is funded by the state, either through annual "cherry sheet" appropriations (Chapter 81) by the Legislature or through the Chapter 90 Program administered by MHD. In 1994 \$193.4 million was made available to cities and towns for local road work; \$150 million through Chapter 90 and \$43.4 million through Chapter 81.

All of the above agencies work together to maintain and operate the Commonwealth's transportation network. This chapter will provide a brief description of transportation financing in Massachusetts, including where the money comes from and what it is spent on to keep the system functioning smoothly.

FUNDING SOURCES AND MECHANISMS

The Massachusetts transportation network is financed through a variety of revenue sources which may be broken down into three general categories: federal funding, state funding, and direct income. These sources are described briefly below.

Federal Funding

Massachusetts received over \$1 billion in transportation funds from the federal government in FY 1994. The major sources of these funds and the approximate percentage from each were as follows:

Federal Highway Administration (FHWA)	87%
Federal Transit Administration (FTA)	10%
Federal Aviation Administration (FAA)	3%
Federal Railroad Administration	< 1%

Most of these federal funds are dispersed to the states through a complex legislative process of authorization and obligation as described below.

Authorization and Apportionment

The first step in the federal funding process is authorization. The United States Congress authorizes funding for transportation projects through federal legislation. For highways and public transportation, the most recent authorization was ISTEA. This legislation authorized more than \$155 billion in funding nationwide over a six-year period ending in Federal Fiscal Year (FFY) 1997. Most of these funds are apportioned to the states on a needs-basis formula which considers the state's population, road miles, vehicle miles travelled, and air quality. Other funds are apportioned on a competitive grant basis.

Massachusetts is authorized to receive about \$5 billion over the six-year life of ISTEA in the 11 general categories listed in Table 7-1. Due in great part to the federal government's commitment to fund a major portion of the Central Artery/Tunnel (CA/T) project in Boston, the Commonwealth's FFY 1994 apportionment of \$1.05 billion ranks third among all of the states. In fact, of the \$5 billion total for Massachusetts, over \$2.4 billion has been authorized for the CA/T project. If not for the CA/T project, the State would not have received this level of federal funding.

Appropriation Process and Obligation Authority

In order for a state to receive the federal funds authorized to it through legislation such as ISTEA, the U.S. Congress must also appropriate the funds through the annual budget process which are then apportioned by formula to the states. Each year Congress also establishes an obligation limit which caps the amount of contractual obligations into which the federal government will enter into during the upcoming fiscal year. For transportation, this obligational limit may be equal to or less than the total appropriations included in ISTEA depending on the overall budget approved by Congress. For instance, Table 8-1 shows that although Massachusetts was apportioned about \$790 million in FFY 1995, the state received only about \$715 million in obligational authority. Massachusetts was not

allowed to access the remaining \$75 million due to the federal government's overall obligation cap. In fact, as of the end of FFY 1994, Massachusetts had a total unobligated balance of \$810 million, the highest of any state in the nation. The Commonwealth's ability to gain access to these funds in the future is dependent on Congressional action.

Flexible Funding

ISTEA signified a new era in transportation financing by giving transportation decision-makers at the state and local levels much more flexibility in deciding how federal highway and transit funds should be used to meet a state's individual transportation needs. By allowing states to use some

Table 7-1
Massachusetts Estimated Apportionment of ISTEA Funds
Per Federal Fiscal Year
(Based on FHWA Estimates, November 1994)

	\$ Millions					
Funding Category	1992	1993	1994	1995	1996	1997
Interstate Completion (CA/T)	429	760	757	472	-	-
Interstate Maintenance	41	47	46	46	46	46
Bridge Program	96	119	110	109	109	109
Surface Transportation Program (STP)	7	5	15	16	16	16
Highway Planning and Research (HPR)	14	21	20	16	15	15
National Highway System (NHS)	52	62	62	61	62	62
Metropolitan Planning	3	4	4	4	4	4
Interstate Transfer	4	4	1	1	-	-
Congestion Mitigation & Air Quality (CMAQ)	33	40	40	40	40	40
Toll Reimbursement	-	-	-	-	97	97
Hold Harmless	13	0	0	23	353	345
Total Apportionment (Rounded)	692	1060	1060	790	740	730
Obligation Authority	687	877	1040	715	N/A	N/A

ISTEA funds interchangeably for highways, transit, or intermodal purposes, regions can determine the appropriate mix of projects to most efficiently attain their transportation goals. For FYs 1993 and 1994 Massachusetts transferred about \$62 million in "traditional" highway funds to transit; the state has programmed a transfer of \$40 million in FY 1995. Since transit improvements can potentially decrease or eliminate the need for expanding highways, it makes sense for states to apply these transfers under the appropriate circumstances. In fact, Massachusetts is among the leaders of all the states in using the flexibility of ISTEA to transfer funds for transit improvements.

Redistribution of Unused Obligation

Through the annual appropriation process, Congress distributes discretionary funds for transit projects, special funds for earmarked projects, and redistributes any unused obligational authority from the previous year. In other words, if a particular state does not spend up to its annual obligational authority, these funds are redistributed to other states who have spent their entire authorization. Over the past few years, Massachusetts has been committed to spending 100% of available federal funds for transportation. As a result, the Commonwealth has received a "bonus" from FHWA for the past two fiscal years: \$54 million in FY 1993 and \$55 million in FY 1994 the highest of any state in the nation.

In order to leverage all available federal funds (and become eligible for these bonuses), Massachusetts has developed a diverse statewide transportation program which maximizes funding in the proper amounts and categories. In addition, the state must come up with its share of project funding. Through ISTEA, the federal government reimburses the state for about 80% of most project costs (90% for most of the CA/T Project). However, Massachusetts must first commit its funds to the entire project cost prior to reimbursement and then, after reimbursement from FHWA, the Commonwealth's costs are its 20% state share.

Other Federal Funding

In addition to the flexible funds provided by ISTEA for transit purposes, the Federal Transit Administration (FTA) provides Massachusetts with federal funds specifically for mass transportation. As with FHWA funds, the allocation of most FTA funds to states and individual agencies (such as the MBTA) is based on two factors:

1. the annual FTA budget, and
2. a statistical formula which considers a number of factors, including population, vehicle miles operated, and route miles.

Other FTA funds are distributed at the discretion of FTA on a project-specific basis. The largest FTA programs reference pertinent sections of federal legislation known as the Federal Transit Act:

- Section 3 funding for the construction, or extension, of new transit service projects, modernization of existing rail systems, and major bus purchases and related capital costs;
- Section 9 capital and operating assistance to transit systems in urbanized areas;
- Section 16(b) for the provision of transit services for the elderly and disabled;

- Section 18 capital and operating assistance to transit systems in rural areas; and
- Section 23 Interstate Transfer Funds previously allocated for highways now used for transit.

In FY 1994 the MBTA received about \$104 million in federal FTA funding \$18 million in operating assistance and \$86 million for capital improvements. In addition, the Commonwealth's RTAs received approximately \$7 million in federal aid for transit service.

Through the Federal Aviation Administration (FAA), the federal government also funds capital improvements at Massachusetts airports through its Airport Improvement Program (AIP). The AIP establishes funding for airports in four ways:

1. federal grants to airports, based upon activity levels;
2. various "set-asides" programs to direct more limited amounts to specific categories of airports and types of projects;
3. discretionary accounts, based on FAA analysis of needs; and
4. the Passenger Facilities Charge (PFC) Program through which passengers at a particular airport are charged a fee, for which revenues are earmarked for specific airport improvements. Although these are not federal funds, the FAA must approve the PFC and its use. In Massachusetts, only Logan Airport can charge a PFC.

Typically, FAA funding must be matched by both state and local funds, at a ratio of 90% federal, 7% state, and 3% local. There are, however, exceptions to this rule based on the type of airport improvement project.

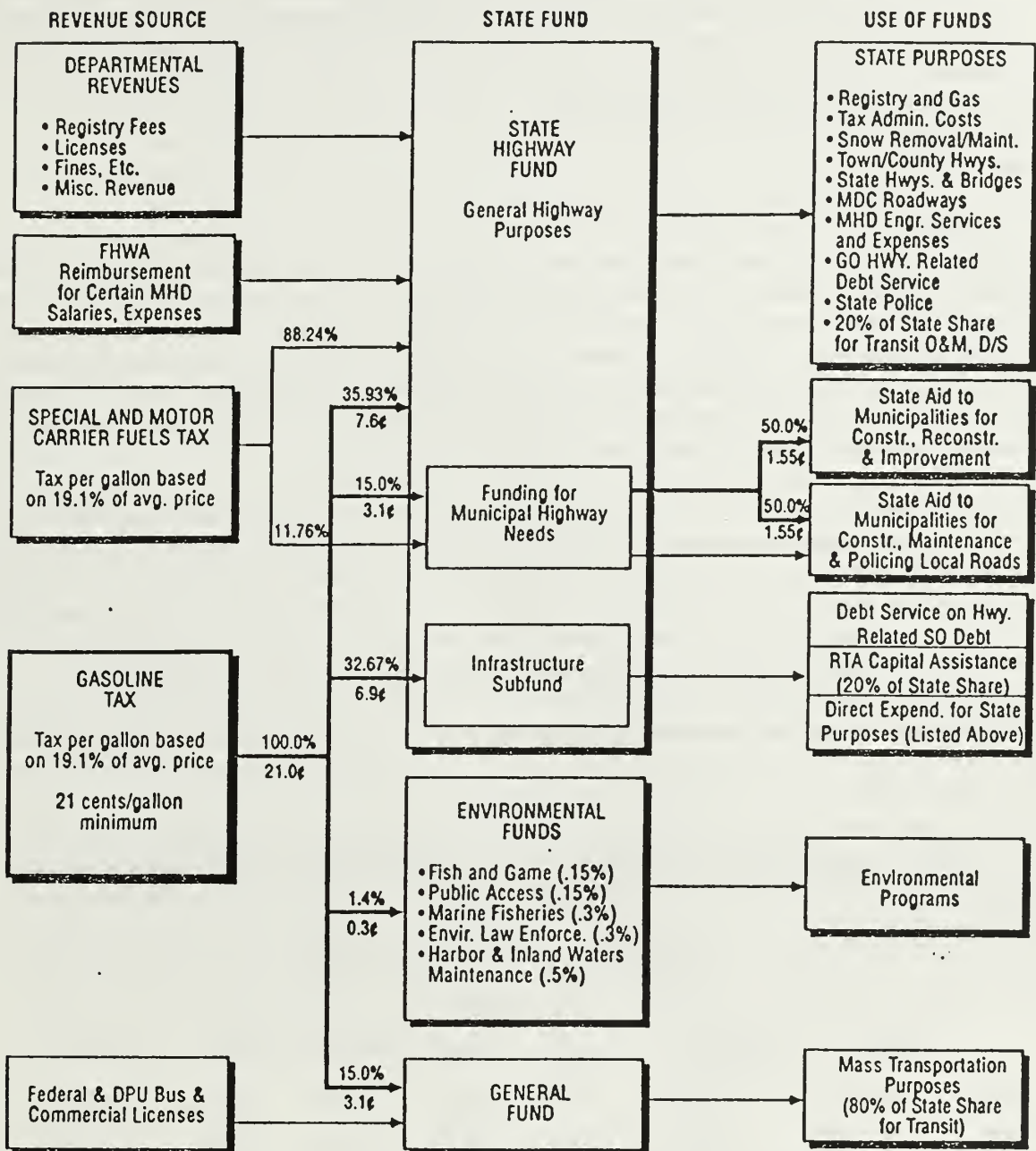
MAC received \$15.4 million in federal funds during FY 1994 for airport improvements across the state, and Massport received approximately \$16.8 million for Logan Airport in addition to funds generated through the PFC Program.

State Funding

In order to pay for the state share of federally aided projects and to undertake other projects not eligible for federal funding, the Commonwealth spent about \$1 billion in state funds during FY 1994 for transportation purposes, not including funding for the State Police, Registry of Motor Vehicles, and other state agencies. State dollars for transportation come from a number of sources, including the gasoline tax, other motor fuels taxes, license and registration fees, and auto excise taxes. Most of these sources are known as direct user fee revenues, whereas the users of the transportation system those who buy cars and gas and obtain licenses are the ones paying for transportation improvements. Secondary sources of state funds are indirect fees which include a portion of general income taxes or local property taxes.

As in most states, the major source of user fee revenues for transportation in Massachusetts is the gasoline tax. The Commonwealth started collecting a tax on gasoline in 1928. Since 1991 the tax has held at 21 cents per gallon, just slightly higher than the nationwide average of 18.6 cents. As Figure 7-1 illustrates, 83.6% of gasoline tax revenues are distributed to the Highway Fund, 15.0% to the General Fund (for transit), and 1.4% to a variety of environmental funds. Fifteen percent of the

Figure 7-1
Revenue Generated By the Commonwealth of Massachusetts for
Transportation



Sources: MGL Ch. 29, S. 2(O) & 29(O); MGL Ch. 64A, 64E & 64F; MGL Ch. 81, S.31; MGL Ch. 90, S.34

portion of the gasoline tax which is deposited into the Highway Fund is mandated for local use in all 351 Massachusetts cities and towns. In addition to local uses, the Highway Fund also provides state funding for roadway and bridge projects across the Commonwealth, the State Police, the Registry of Motor Vehicles, and 20% of the state share for some transit costs. No more than 10% of gas tax receipts in a fiscal year may be used for the Central Artery/Tunnel project, thus ensuring that the funds are distributed for use throughout the entire state. The disbursement of funds described above, and shown in Figure 7-1, is expected to change during 1995 as a result of Ballot Question 8 approved by voters on November 8, 1994. If enacted into law, revenues from the gas tax will no longer be distributed to the various environmental funds.

Bond Proceeds

Massachusetts finances most of its share of the capital improvement program, including transportation, through bond sales. Debt service on these loans is then paid off through the General Fund and Highway Fund, both of which are partially financed from gas and other highway user fees. In this way capital improvements are paid for over the length of time that taxpayers are receiving the benefits from them. Just as a homeowner takes out a 30-year mortgage to finance a house, the Commonwealth pays for trucks over a 5-year period, and bridges over a 20-year period, depending on the projected life of the project or equipment. The majority of highway, transit, and aviation projects, at both the state and local level, are funded in this way.

In order to borrow these funds, EOTC must prepare a Transportation Bond Bill (TBB) approximately every two years. The TBB outlines the programs and projects that transportation agencies would like to undertake in the upcoming years and lists the required funds, both state and federal, that will be needed for them. Once approved by the State Legislature and signed by the Governor, the agencies are authorized to borrow funds, subject to program and project limits set forth in the TBB. Table 7-2 shows the distribution of authorizations for the last two bond issues.

Table 7-2
Bond Authorization by Agency for 1988 and 1991 Transportation Bond Issues

(Numbers do not include federal funds)

(\$ millions)

	MHD	EOEA/MDC	EOTC	MAC	MBTA	Other	TOTAL
1988	\$633.4	\$41.8	\$49.0	\$6.1	\$838.3	\$0.9	\$1,156.5
1991	\$1,209.6	\$120.0	\$39.4	\$8.6	\$1,090.9	\$12.9	\$2,481.4

To generate the funds authorized in a TBB, the state issues either general obligation (GO) or special obligation (SO) bonds. GO bonds are backed by the general revenue of the state; SO bonds are backed by a dedicated revenue stream from the gasoline tax to the Infrastructure Subfund which is part of the Highway Fund (Figure 7-1). In the past the Commonwealth has used GO bonds as its primary bonding mechanism; however, the State Treasurer does have the option to issue SO bonds should interest rates and other conditions warrant it.

As independent authorities, Massport and the MTA have the legal authority to issue their own revenue bonds to finance capital improvements. There is no state backing of funds associated with these bonds since the authorities generate sufficient revenues through tolls, fees, and other income, to make all principal and interest payments. Because of their legal and financial independence, these independent authorities are not subject to the same legislative and executive oversight as other state transportation agencies and authorities. The MBTA is allowed to sell bonds to finance capital projects. However, the bonds are backed by the Commonwealth with the debt service funded through a combination of the Highway Fund, the General Fund, the Local Aid Fund, and by local governments. Ninety percent of the debt service costs are reimbursed by the Commonwealth with the remaining 10% funded through local assessments on member communities as well as additional state assistance. The RTAs may not issue bonds independently; however they can be issued with the approval of the Secretary of Transportation. Instead, the RTAs typically "pre-fund" capital projects through short-term bond authorization notes (BANs) with local banks and are subsequently reimbursed by the Commonwealth, usually within three years. RTAs receive their capital funds from both FTA and the Commonwealth. Unlike Massport and MTA, these authorities must rely heavily on the state to provide assistance, both through the transportation bond issue and annual appropriations.

State Capital Spending Cap

In recent years the Commonwealth's Executive Branch has increasingly focused on consolidated capital expenditures and debt on a statewide basis. Particular attention has been paid to transportation which makes up a large proportion of total state capital expenditures. The mechanism by which the Executive Branch controls statewide bonding levels is the Governor's Five Year Capital Plan which lays out capital expenditure levels for the various state agencies. Under the Capital Plan each secretariat requiring capital expenditures (including EOTC) is assigned a maximum expenditure level, or cap, which is determined by the state's broader financial situation. The secretariat caps are based on expenditure levels requested by the secretariats which are modified to fit within the financial framework deemed necessary to maintain a positive rating for the Commonwealth's bonds. Although the Executive Branch has allowed flexibility in expenditure levels between programs, overall expenditures must remain within the ceiling specified in the original plan. By bonding conservatively in recent years Massachusetts has been able to preserve a favorable bond rating, making it less expensive to borrow money for capital improvements.

Annual Appropriations

State appropriations, through the operating budget, are made on an annual basis and are used primarily for current year operating needs and debt service payments on previously issued bonds. Each year the State Legislature also has the option of providing an annual appropriation through the general operating budget to finance capital improvements on a "pay-as-you-go" basis, eliminating debt

service by paying for projects with cash on hand rather than through a bond issuance. The amount of the appropriation, if any, depends on the available balance in the Highway Fund and the balancing of the overall operating budget. FY 1993 was the only recent year in which "pay-as-you-go" funds were made available for capital projects through the operating budget.

Direct Income

Certain transportation authorities in Massachusetts also generate income internally by charging users tolls or fees for using their services. For instance, in FY 1993 the MBTA generated \$153.5 million in revenue primarily from transit fares. Massport, in FY 1994, collected about \$249 million and MassPike, during 1993, collected \$156 million. In the case of Massport and MassPike, these revenues covered all of the authorities' capital and operating costs. For the MBTA, direct income only accounted for 20.1% of operating costs.

FLOW OF STATE TRANSPORTATION FUNDS

This section describes the flow of dollars to and through the major transportation agencies of the Commonwealth from revenue source, into various state funds, and ultimately to the appropriate agency for expenditure. Where considered helpful, the flow has been depicted graphically. It is worth noting that other state agencies such as the State Police, the Registry of Motor Vehicles, and the MDC also receive funding for transportation-related purposes.

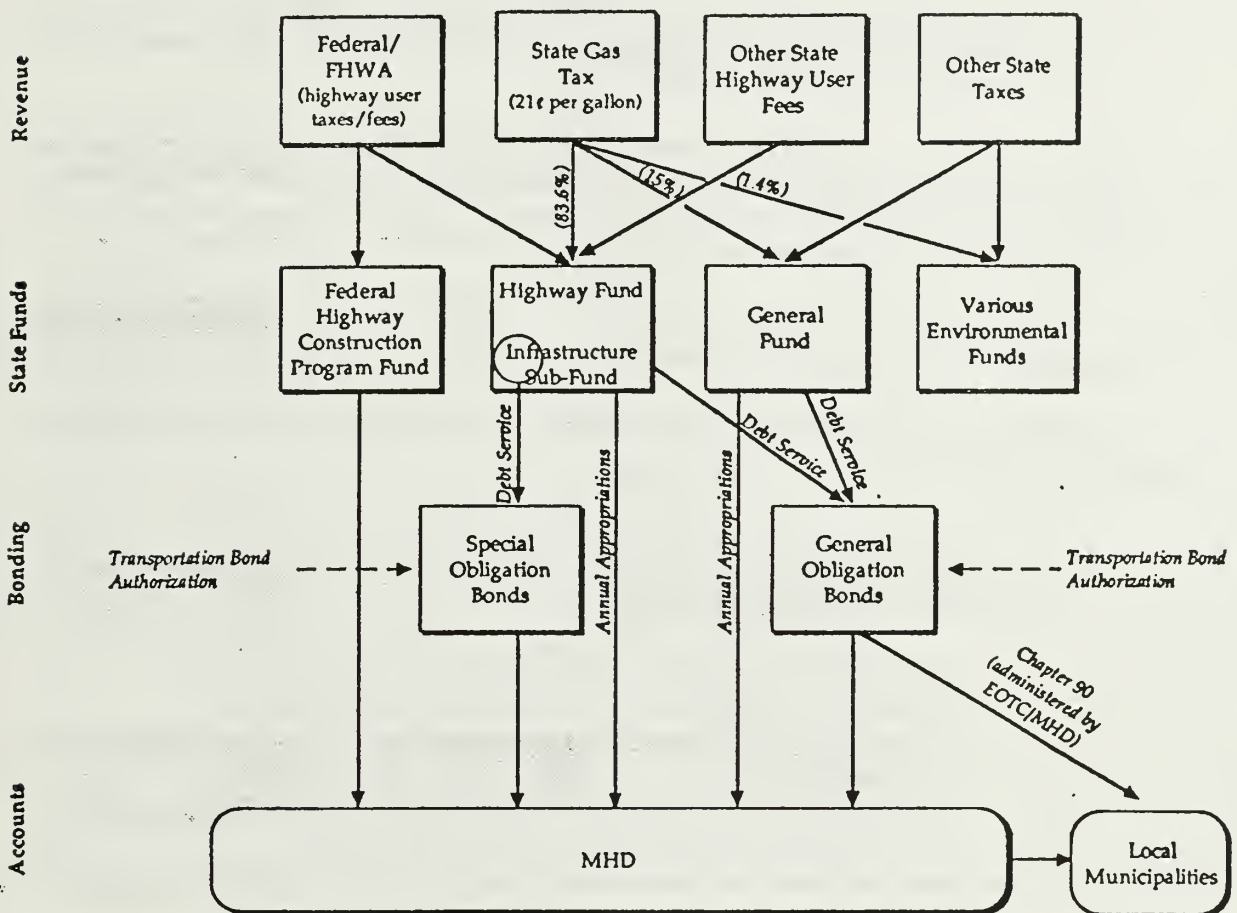
Massachusetts Highway Department

Financing highway projects in Massachusetts involves a complicated process of securing adequate funding from a number of sources, including those listed below. As Figure 7-2 indicates, most of these revenues are then deposited into one of three primary funds (the Federal Highway Construction Program Fund, the Highway Fund or the General Fund) before they become available for expenditure.

1. Federal Appropriations: Since 1956 the federal government has used the Federal Highway Trust Fund (HTF) as a major source of federal transportation funding for the states. Like the Commonwealth, a primary source of revenue for the HTF is the federal tax on gasoline and other fuels. For instance, 18.4 cents per gallon of gasoline is currently collected and distributed by the federal government as follows:

Highway Trust Fund (for highway use)	10.0 cents
Highway Trust Fund (for mass transit)	1.5 cents
Leaking Underground Storage Tank Fund	0.1 cents
General Fund (for deficit reduction)	<u>6.8 cents</u>
Total	<u>18.4 cents</u>

Figure 7-2
Flow of Transportation Dollars: Massachusetts Highway Department



2. State Gasoline Tax: Approximately \$503 million was raised through the 21 cent per gallon state gasoline tax in FY 1994. Of this amount, approximately \$420 million was deposited into the Highway Fund. The rest was applied to various environmental funds or to the General Fund for mass transportation.
3. Other State Highway User Fees: In addition to the gasoline tax, automobile registration fees, drivers license fees and a tax on special fuels are also collected and applied to the state's transportation needs. These fees totalled about \$390 million in FY 1994.
4. Other State Taxes and Revenues: Through the General Fund other revenues such as bus licenses, vehicle excise taxes and even a portion of the state income tax can contribute to highway financing.

Table 7-3 breaks down all MHD capital expenditures for FY 1994 by source (federal or state) and use. Of the \$1.32 billion spent on the FY 1994 capital program, over 70% came from the federal government. In addition, the MHD spent \$140 million during FY 1994 on operating expenses funded almost exclusively from state revenue sources.

Massachusetts Bay Transportation Authority

The MBTA also derives its funding from a number of sources as described below and shown graphically in Figure 7-3.

1. MBTA Direct Income: The MBTA generates its own income from a number of activities, including the following:
 - fares collected for its rapid transit, commuter rail and bus services;
 - parking fees collected at transit and commuter rail parking lots;
 - revenues from advertising that is placed in subway stations, subway cars, buses and trolleys;
 - concession rents from newspaper stands and push carts at stations;
 - rents collected for the use of other MBTA properties; and
 - leasing rights to install fiber optics communication lines within MBTA rights of way;

As would be expected, passenger fares generate about 90% of the MBTA's direct income which totalled \$153.5 million in 1993. Parking contributes approximately 4%, and all other sources less than 2% each.

Table 7-3
Massachusetts Highway Department Capital Expenditures
State Fiscal Year
(\$ millions)

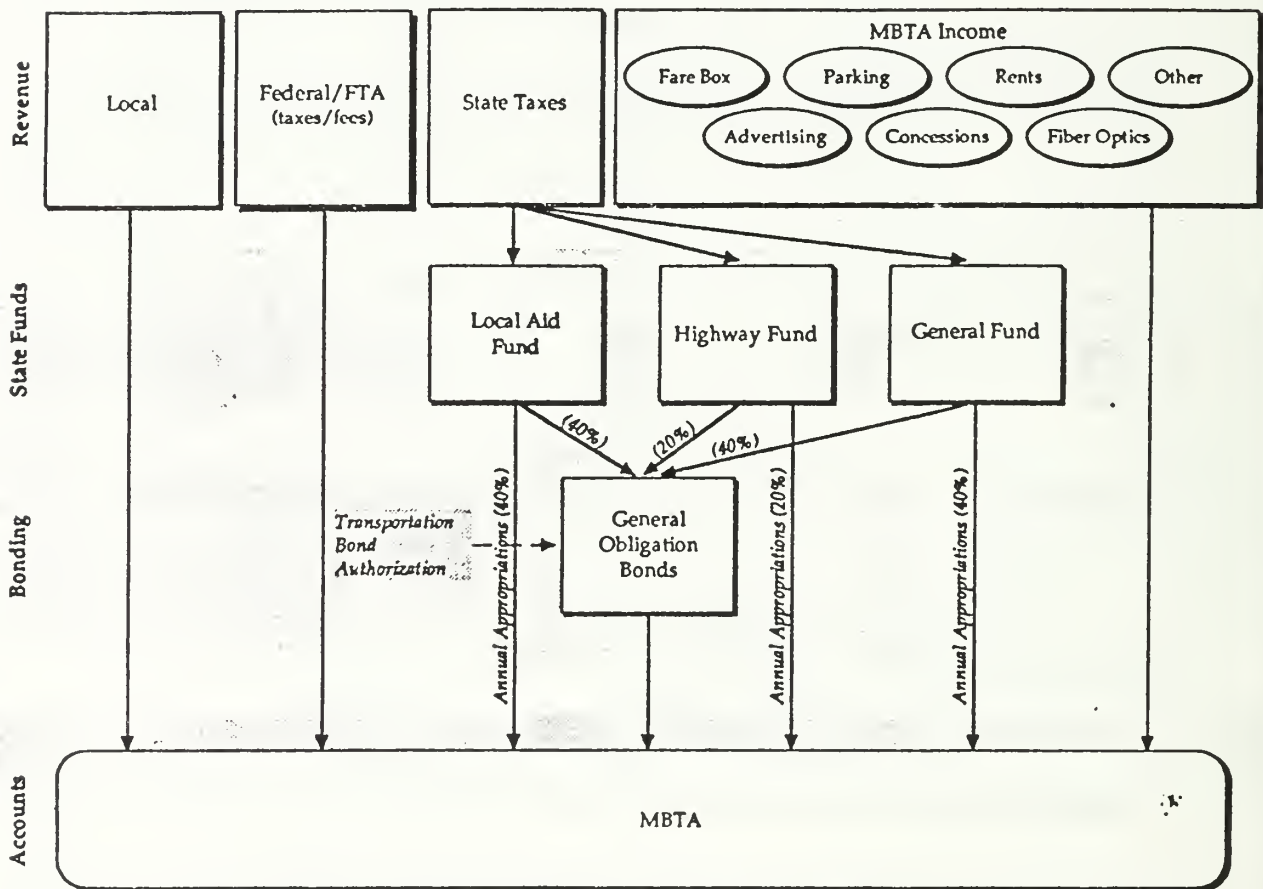
Category	Federal Expenditures	State Expenditures	Total Expenditures
FA Interstate	\$741.0	\$89.6	\$830.6
FA Non-Interstate	\$186.1	\$59.5	\$245.6
NFA Highways and Bridges	\$0.00	\$124.5	\$124.5
Local Aid	\$0.00	\$80.7	\$80.7
Environmental	\$0.00	\$12.1	\$12.1
Planning & Research	\$14.5	\$3.6	\$18.1
Maintenance Sites & Equipment	\$0.00	\$5.5	\$5.5
Other	\$0.00	\$2.7	\$2.7
TOTAL	\$941.6	\$378.2	\$1,319.8

FA=Federal Aid; NFA=Non-Federal Aid

This table does not include MHD operating expenses.

2. **Local Assessments:** Seventy-nine cities and towns in the MBTA District are assessed a share of the MBTA's expenses for providing mass transit services to them. The assessment charged to each community is based on a complex formula which includes the type of service the community is provided, as well as on population and boarding counts. In simple terms, the formula is designed to spread the costs of public transit among the communities based on the direct and indirect benefits they receive.

Figure 7-3
Flow of Transportation Dollars: Massachusetts Bay Transportation Authority



The communities' share of MBTA costs has decreased dramatically over the years. Prior to 1973 the cities and towns were required to pay for the MBTA's entire net cost of service (total expenses less total revenues). In an effort to relieve some of the local financial burden, the Commonwealth began contributing to a portion of the cost in 1973 and in 1974 the federal government began to provide annual operating subsidies for mass transit. In 1980 Proposition 2½ capped the growth in the municipal property taxes at 2.5% annually, regardless of the MBTA's actual needs for the year. Declining property values over the past few years have also hampered the local communities' ability to maintain their share of the cost of operating the MBTA.

3. **Federal Funding:** In FY 1994 the MBTA received \$104.4 million in FTA funding: \$18.2 million in operating funds and \$86.2 million in capital funds, as follows:

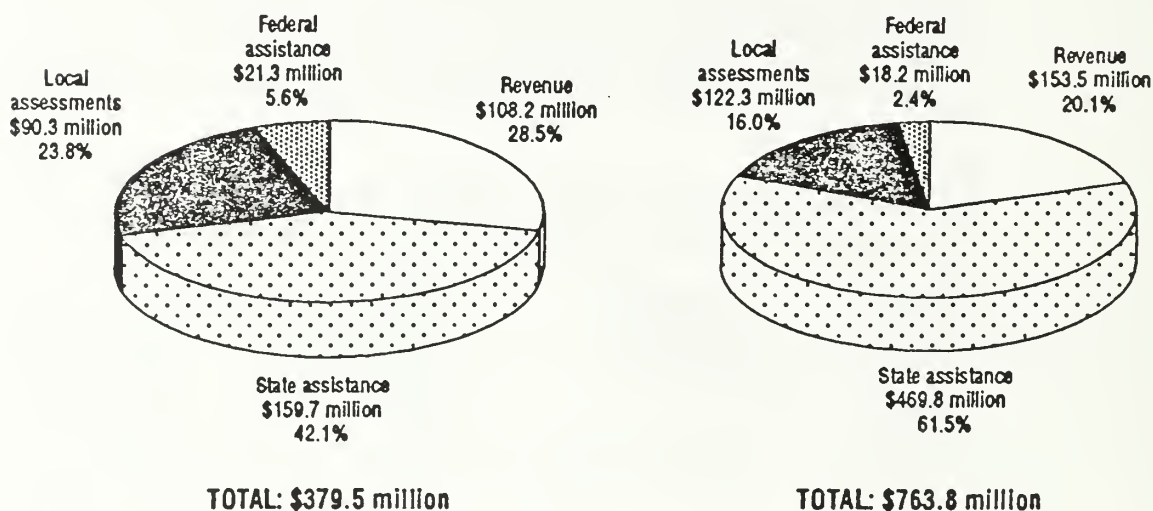
Federal Funding Source	Operating Assistance (in millions)	Capital Assistance (in millions)	Total (in millions)
Section 3	\$ 0.0	\$40.7	\$40.7
Section 9	\$18.2	\$40.9	\$59.1
Section 23	<u>\$ 0.0</u>	<u>\$ 4.6</u>	<u>\$ 4.6</u>
Total	<u>\$18.2</u>	<u>\$86.2</u>	<u>\$104.4</u>

In addition, the MBTA received about \$24 million in federal funding through ISTEA transfers during FY 1994. Although operating assistance has remained fairly constant over the past several years, capital assistance is subject to considerable change, especially in terms of discretionary grants for particular transit projects and funding transfers from ISTEA.

4. **State Funding:** The Commonwealth provides the MBTA with two means of financial assistance. The first is by covering the Authority's annual operating deficit (which includes debt service payments). The second is by including MBTA capital projects in a transportation bond issue, which allows the MBTA to pay for capital costs with bond proceeds. In 1993 the state provided the MBTA with \$469.8 million in operating assistance which included \$165.5 million for debt service. Both of these forms of assistance are generated from a combination of the General, Local Aid and Highway Funds.

Over the past decade the state share of the MBTA's operating deficit has grown dramatically. As Figure 7-4 shows, between 1983 and 1993 annual state assistance increased from \$159.7 million (42.1%) to \$469.8 million (61.5% of the MBTA's operating costs). The reasons for this are numerous, as discussed above. Although MBTA revenues have increased steadily over the past decade, they have not been able to keep up with operating costs. A decrease in federal assistance and capped growth for local assessments has forced the Commonwealth to pick up the growing tab.

Figure 7-4
Funding Comparison of MBTA Operating Costs
1983 and 1993



Regional Transit Authorities

The RTA financing process is similar in many ways to that of the MBTA. Their revenue sources include federal aid (from FTA and ISTEA transfers); state assistance (from transportation bond issues and annual appropriations); local assessments from member communities; and direct income from passenger fares, advertising and rents. Unlike the MBTA, state funding for RTA operating assistance is capped by state law (Chapter 161B) the Commonwealth may cover up to 75% of each RTA's net service costs. Because RTA debt service is considered an operating expense, it is subject to the cap.

In FY 1994 RTAs received approximately \$7 million in federal aid, \$42 million in state assistance, and \$10 million from a combination of local assessments and direct income. Of the \$42 million in state assistance, the majority (approximately \$31 million) was for operating costs and the remainder (\$11 million) for capital costs.

Massachusetts Aeronautics Commission

The majority of public use airports in the Commonwealth are overseen by MAC. The only exceptions are Logan and Hanscom Airports which are controlled and managed by Massport. MAC collects aviation-related taxes and fees and directs them to the General Fund. The annual amount

collected is approximately equal to the annual MAC operating budget of \$0.6 million. However, the MAC cannot access any of these funds without legislative authorization and appropriation.

The Commonwealth provides MAC with the majority of its operating dollars through annual appropriations. Some capital projects are also funded in this way. In recent years approximately 77% of the state's annual appropriation to MAC has been for operating costs and 23% for the state's share of capital costs. Most capital projects are funded by a combination of federal, state and local funds (typically at a 90%:7%:3% ratio). Other projects not eligible for federal FAA funding are financed entirely with state and local funds (typically at a 70%:30% ratio). The majority of MAC's share of capital costs comes from state transportation bonds.

In FY 1994 MAC expended about \$17.7 million which included \$0.6 million for operating costs and \$17.1 million for capital projects. Of this, approximately \$15.4 million, or 87%, was funded by the federal government. Figure 7-5 illustrates the structure of funding sources for MAC.

Massachusetts Port Authority

As an independent authority, Massport receives no state funding. In order to operate, maintain, and improve its facilities, the Authority relies primarily on its own direct income, and Logan Airport is eligible for some federal funding from FAA (see Figure 7-6). Since revenues from most operations are consolidated, unprofitable facilities, such as the Tobin Bridge, can be subsidized by more profitable operations to some degree. The following are Massport income sources.

1. **Direct Income:** Massport generates most of its own revenue from the services and facilities it controls and operates. For FY 1994 this included the following revenues, broken down by Massport activity or facility:

Income Source	Amount (\$ million)	Percent
Airport Properties	\$202.1	81.2%
Port Properties	\$ 31.4	12.6%
Investment Income	\$ 10.1	4.0%
Tobin Bridge	\$ 5.4	2.2%
Total Net Revenues	<u>\$249.0</u>	<u>100.0%</u>

The revenues generated include Tobin Bridge tolls, aircraft landing fees, Logan Airport parking fees, and concession and rental income from Massport properties.

2. **Federal Funding:** Massport received about \$16.8 million in FY 1994 from the federal government in the form of construction grants through the FAA's Airport Improvement Program (AIP). Massport also benefits from the FAA's Passenger Facility Charge (PFC) Program. Since November 1993 a \$3.00 PFC has been imposed on every Logan Airport passenger. Between 1993 and 2011 the PFC is expected to generate \$599 million, a portion of which will be used to partially fund the \$1-1.5 billion Logan Airport Modernization Program.

Figure 7-5
Flow of Transportation Dollars: Massachusetts Aeronautics Commission

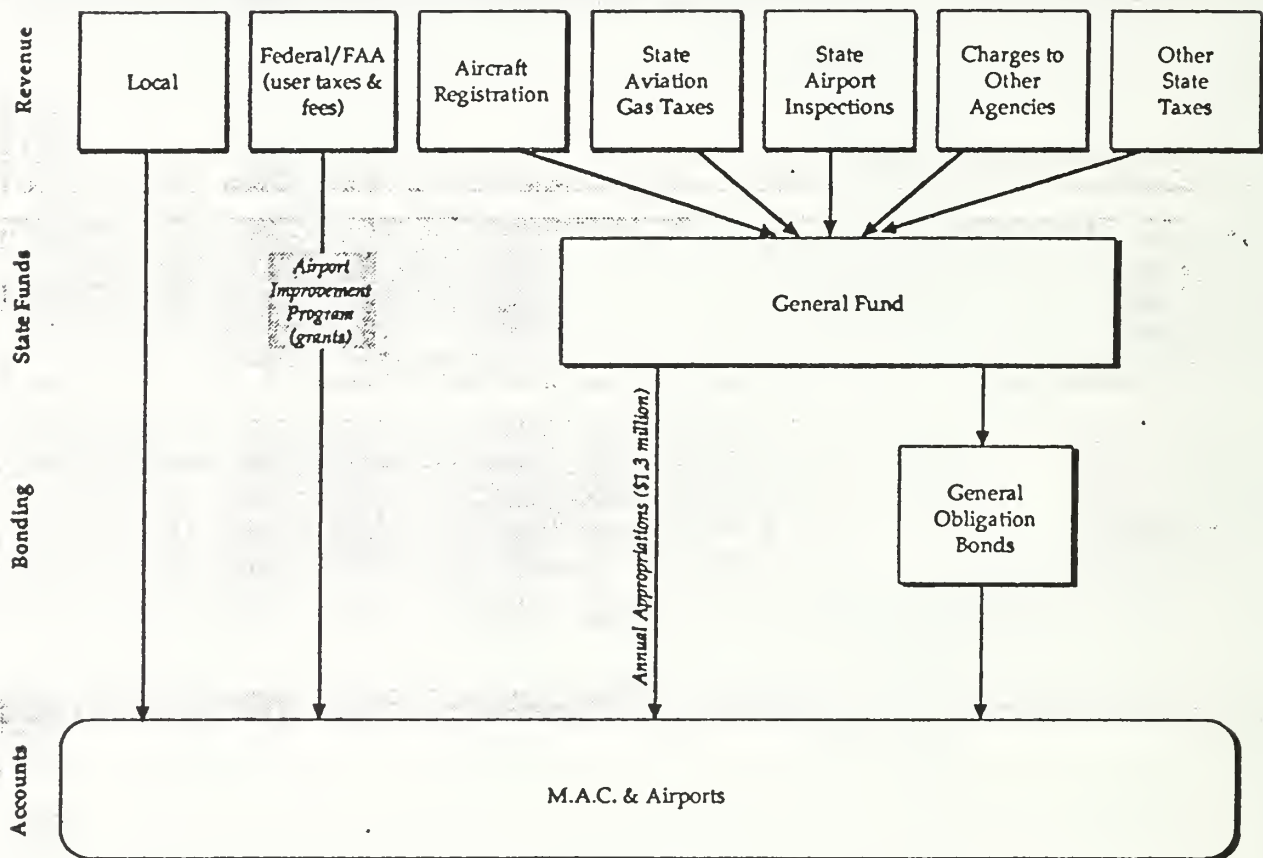


Figure 7-6
Flow of Transportation Dollars: Massachusetts Port Authority

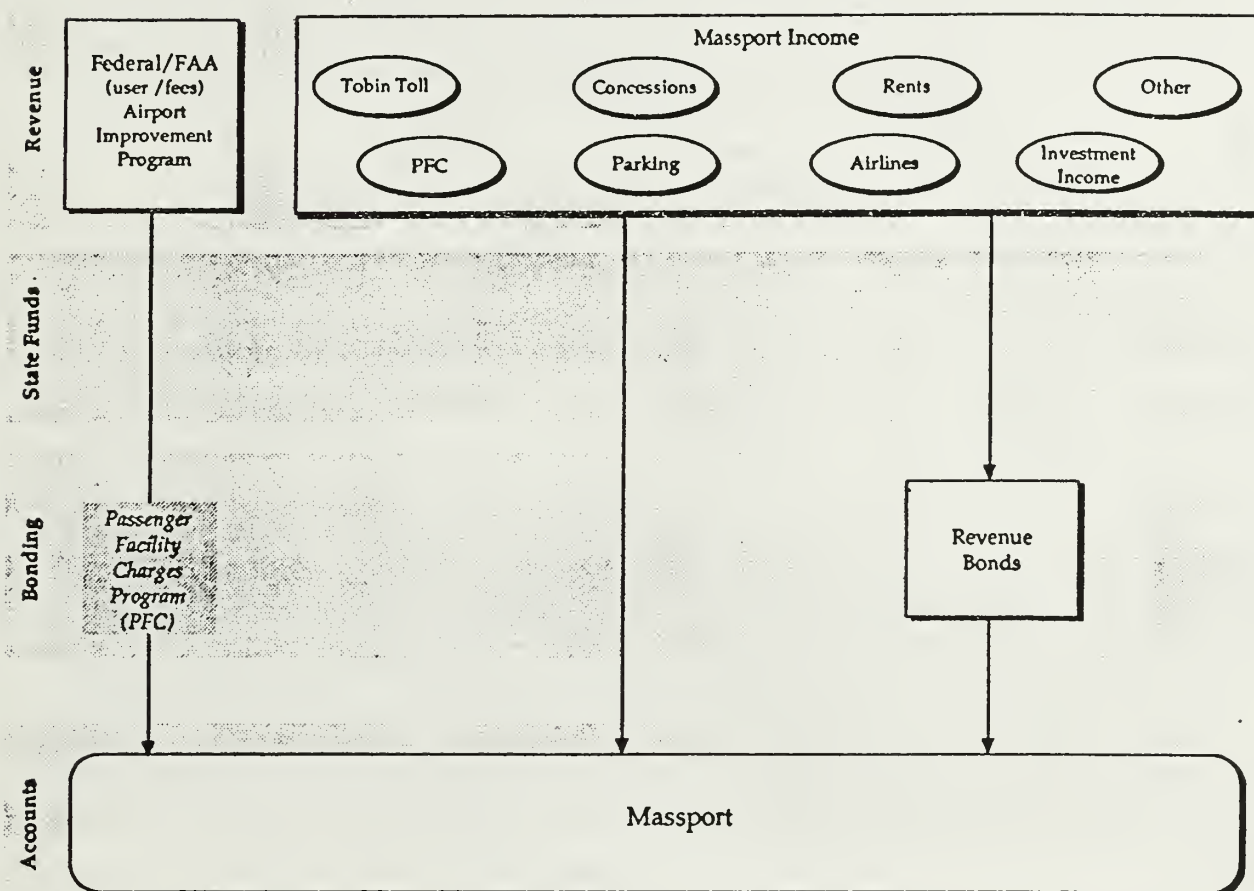
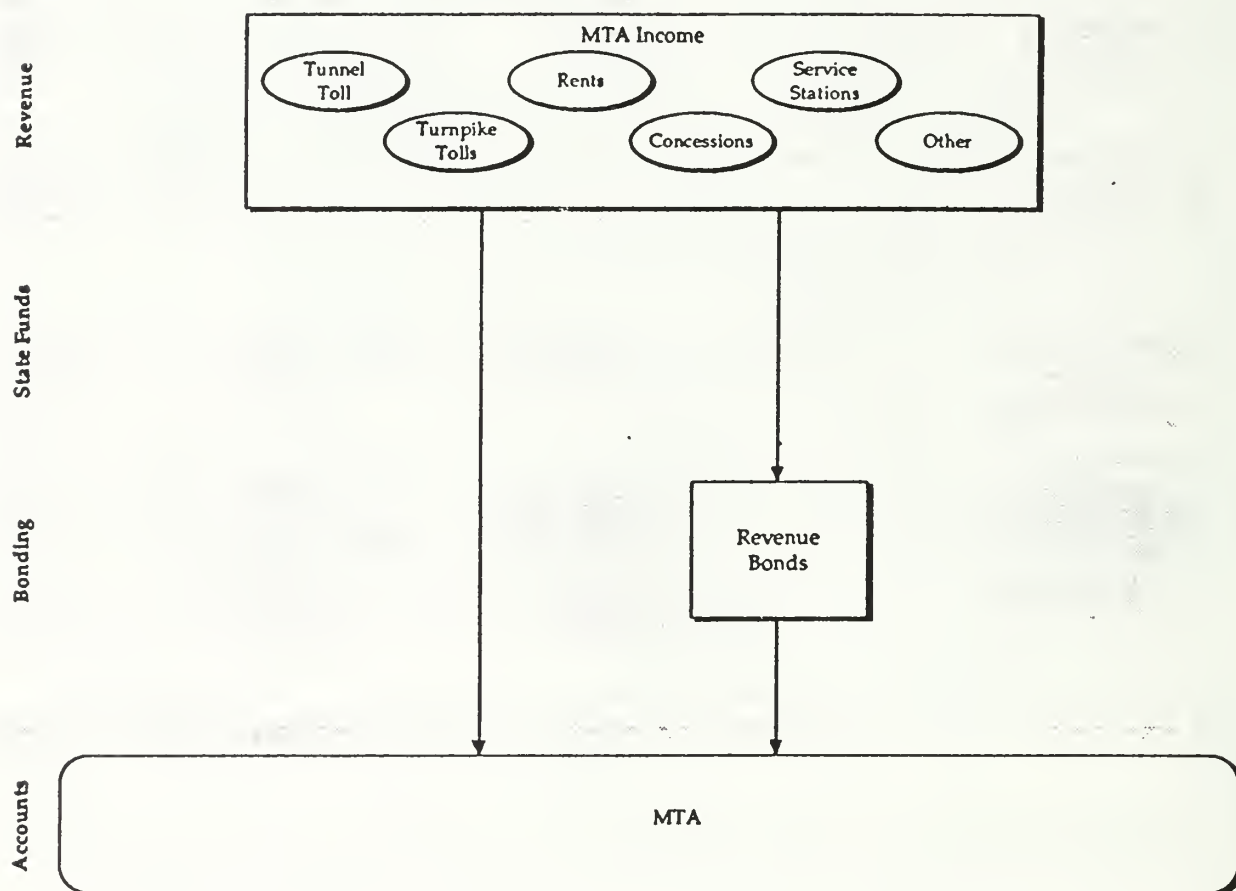


Figure 7-7
Flow of Transportation Dollars: Massachusetts Turnpike Authority



Massachusetts Turnpike Authority

In 1952 the MassPike was created by the Massachusetts Legislature as a financially self-supporting entity. As a result, for over 40 years, the Authority has never received any state or federal tax revenues. All of MassPike's revenue used to design, construct, operate and maintain the Massachusetts Turnpike is generated internally from tolls and facility-related charges and rents (see Figure 7-7).

The distribution of direct income generated by the MassPike in 1993 is shown below. Turnpike and tunnel toll revenues are separated here because the two facilities are operated separately for cost and revenue purposes. Each is governed by separate legislation and trust agreements which are contracts with bondholders specifying how and where revenues can be spent. The Authority also issues revenue bonds to fund some of its capital projects. The debt service on these bonds is funded directly from MassPike income. The following are MassPike income sources.

Source of Income	Amount (\$ million)	Percent
Turnpike Tolls	\$129.8	83.4%
Sumner/Callahan Tunnel Tolls	\$ 16.1	10.3%
Rental Income	\$ 4.0	2.6%
Restaurant/Concessions	\$ 2.4	1.6%
Service Stations	\$ 2.4	1.5%
Investment Income/Other	\$ 0.9	0.6%
Total Revenues	<u>\$155.7</u>	<u>100.0%</u>

FINANCING OPTIONS FOR MASSACHUSETTS

Currently, the major sources of transportation funding in Massachusetts are federal funds and state user fees and taxes. The following sections describe potential alternatives to state taxes for financing transportation in Massachusetts. These alternative financing methods do not reduce the costs of transportation projects, per se, but rather, serve to spread costs more widely among users or the private sector or to generate revenues through means other than traditional taxes. Massachusetts has been pursuing some of these mechanisms for some time, while others may not be presently feasible. However, all options should be considered in planning for long term transportation financing.

Private Sector Financing, Fees, and Payments

Several private sector financing methods have been explored to fund highway and other public facility improvements. While some of these methods are most appropriate in areas where there is strong growth and development pressure, the widespread use of many of these concepts suggests that the private sector is aware of the critical role that public infrastructure plays in supporting economic development.

Private Ownership

Private development of a transportation facility is feasible when the facility has the potential to generate enough revenue to provide a competitive financial return to investors in the facility or when a public agency is willing to provide a sufficient subsidy to make the investment attractive.

In the case of highways, the primary, potential, private sources of revenue are toll roads and/or appreciation in the value of surrounding property. If these sources of revenue are not sufficient and there is a clear public purpose in the project, public funds could pay a portion of the cost, either up front or over a period of years. An alternative to a privately operated toll road is the lease of a privately built facility by a public agency. Some situations in which private development may be appropriate are:

- if a private company could build a facility more quickly and less expensively; and/or
- if a developer is willing to pay the cost of the improvement because of the effect it will have on the value of the property he/she owns.

Special Benefit District Assessment

A special benefit assessment is a tax placed on properties within a designated district that is expected to benefit from a public improvement. In this way owners of properties that increase in value due to the improvement pay for all or part of the improvement (construction and/or maintenance). Determining the amount of benefit and the allocation of improvement costs to private property owners can be difficult and is generally accomplished through the use of a formula that may be based on acreage, floor area, and distance from the improvement, for example. The tax may be one-time or ongoing so as to be timed to coincide with bond payments. The tax must also be reasonable so as not to encourage businesses to select a different location in order to avoid the tax. An agency or municipality may make the special assessment, but special state enabling legislation is usually required.

Special benefit assessment has been used in some states to pay for area improvements such as streets, sidewalks, and sewers, and for transit facilities and downtown pedestrian or transit malls. It has also been implemented to finance general expenses for transit systems. A special benefit district could be associated with a highway interchange as well.

Incentive Zoning (for In-kind Improvement)

Incentive zoning offers a developer a bonus in the form of relaxation of a restrictive zoning law or procedure in return for inclusion of an amenity in the development deemed to be in the public interest. Additional development height, for example, could be awarded to a developer who will construct roads that will benefit the public as well as the development or site the development to provide land for future road expansion. This method is a way of providing in-kind improvements rather than directly financing roads. Developer participation in incentive zoning is voluntary.

Negotiated Investments (for Contributions)

The concept of negotiated investments is similar to incentive zoning, but here developers agree to contribute funding for the cost of public improvements required to support their new development, rather than providing in-kind improvements. Again this is generally done in exchange for variances to existing land use regulations as agreed to by the local zoning authority. While the use of zoning approvals in this manner has been legally challenged in some cases as allowing "bribes" for relaxing zoning regulations, bargaining is permitted in some states where the developer and planning commission have considerable flexibility in determining densities and improvements and where enabling legislation or local ordinances explicitly define procedures for permissible negotiations. A negotiated investment strategy is most suitable for locations that are very desirable and where the competition for development is keen. Funding contributions can also be voluntary.

Dedications and Exactions (Required Fees)

While incentive zoning and negotiated investments provide zoning incentives for in-kind or cash contributions, dedications and exactions require contributions. Dedications require a developer to provide land or public facilities as a condition for development approval; exactions require a cash payment. The policy ensures provision of public improvements at the same time that private development is occurring. The dedications and exactions should be legally reasonable requirements, i.e., directly related to the project. Thus, if dedications/exactions are linked to road improvements, they are probably most appropriate for local streets.

Dedications and exactions have historically been used in suburban subdivisions to provide a variety of facilities such as sewer and water lines, parks, and schools. Roads thus compete against a variety of other needed improvements for funds. There may be difficulties using the policy for a new development in an urbanized area where existing developments would also benefit from a public improvement but would not have been subject to the dedication or exaction.

Special District Zoning (Special Planning Districts)

Special district zoning is a variation on the concept of dedications. It specifically applies to a designated special district which is an area with special planning status due to one or more unique characteristics, such as historical importance or strong redevelopment pressure. The master plan for the district includes specifications about how each parcel of land may be used. It can include mandatory requirements on developers such as the provision of transportation-related improvements. While incentive zoning gives developers the option of complying, special district zoning generally requires compliance. Special district zoning also requires strong planning capabilities on the part of the locality.

Leasing/Selling Development Rights

Under this financing scheme, the air, ground, or subsurface rights of parcels associated with a highway are sold or leased. The most frequent use has been for transit finance through which transit agencies lease land above a subway station for building construction; the lease or sale of air rights can also pertain to the spaces over highways.

The leasing/selling of development rights is only applicable in certain situations. Because the costs of air rights construction are higher than for normal construction, developers are only interested in the concept in strong real estate markets that can provide a sufficient rate of return, generally in high density, desirable locations where land is at a premium and in circumstances where urban development funding is available to provide below-market interest rates. For a strong legal position, the agency leasing or selling development rights must have state legislative authority to do so.

Leasing/Selling Surplus Property

To generate revenue some public agencies sell or lease surplus property to the private sector. The entire property or a portion of it may be leased. The use of this financing technique need not be limited to property that is no longer required by the agency, but may apply to new projects as well. Although this method has most often been used by transit agencies, highway departments may also have some excess land to lease or sell adjacent to highway interchanges. It is generally not legal for an agency to acquire more land through eminent domain than is actually needed and then to lease or sell it, but this strategy can be applicable if purchase of land for advanced right-of-way acquisition (land banking) is the reason for an eventual surplus of property.

Tax Increment (Tax Allocation) Financing

Under tax increment financing, also called tax allocation financing, public improvements in a designated area are paid for using the projected increases in property tax revenues that are a likely result of the improvements. These projected increases over initial levels (i.e., the increment of tax revenue) are usually then allocated to back a bond. The method does not increase the tax rate in the designated area nor does it reduce the amount of taxes from the area that goes into other funds. It uses only the incremental increase in tax revenues that results from the increased value of properties in the designated area. Because an area expected to benefit from such improvements must be officially designated, tax increment financing is appropriate for site-specific projects such as highway interchanges or local street improvements. Its historical use has been for urban redevelopment projects in which property values would not be expected to increase in the absence of the public improvements.

To be used, tax increment financing requires state enabling legislation and local ordinances. In cases where authority is given to urban redevelopment agencies, intergovernmental agreements may be required for highway use. Tax increment financing may also arouse the resistance of other taxing jurisdictions and recipients that rely on property tax revenues because of the fear that they will be deprived of additional revenue by tax increment districts, and/or that they will have to make new outlays for districts without receiving additional revenues. These situations may be mitigated by using only a percentage of the property tax increases to back the bonds or by severely limiting the amount and/or value of property in a jurisdiction that may be part of a tax increment district.

Institutional and Intergovernmental Approaches

A number of financing methods are based on intergovernmental cooperative arrangements for sharing a tax base or debt risk, including the following.

Regional Tax Base Sharing

Under regional tax base sharing, all governments within a given region share a percentage of the regionwide growth of the tax base. A tax base sharing plan is based on annual calculation by each local government of the difference in assessed value of all commercial and industrial property within its boundaries between the current year and the base year. A percentage of this growth is contributed each year to a region-wide base, the funds from which are then distributed to all governments in the region by a formula based on population and inversely related to its relative fiscal capacity (i.e., the per capita market value of all real property relative to the metro area average). In effect, each commercial or industrial parcel of property is taxed at two rates: an area average tax rate applied to the proportion of each parcel's assessed value that is contributed to the region-wide base and the local tax rate applied to the remainder of the assessed value.

Under the plan, each local government continues to determine its own level of taxation and the plan is operated without any new administrative apparatus. Advantages are that the plan can reduce inter-community tax base inequities and competition for development, thus helping to stimulate a more efficient pattern of land use and development patterns in which regional rather than purely local considerations are taken into account.

Regional or State Infrastructure Banks

Traditionally, bonding has been an important source for financing local public projects. One means of lowering bond issuance costs and increasing access to credit markets for local governments (and possibly also lowering debt costs) is pooling. Pooling involves the establishment of a special regional or statewide "bank" for financing local capital projects.

Local Government Banks

In western Europe municipally owned savings banks are common and local infrastructure finance is provided in part through those banks. In the United States state bond banks have been created to issue bonds on behalf of local governments. They have also been created to issue debt for which the proceeds are then used to purchase local bond issues. These bond banks have all received a rating one category below the state's regular bond rating. Local governments (particularly small ones with no bond rating) pay higher interest on privately borrowed funds, the sale of bonds to the state bond bank allows them to assume the bond bank's higher rating. This reduces the cost of the debt issue and thus of the project it funds.

State Infrastructure Banks

The establishment of state-sponsored banks specifically intended to fund infrastructure construction and rehabilitation is another funding option. Banks could obtain initial funds by issuing bonds, obtaining state appropriations, and drawing on unused state revenues. "Second generation" income would be generated by a revolving loan fund. Banks could also be funded by revenue bonds backed by fees and payments as well as by state funds earmarked for local projects.

Loan Pools

Short of establishing an infrastructure financing bank is the concept of state loan pools for use by municipalities. In general the concept of an infrastructure bank has the advantage that it helps establish a priority for infrastructure in terms of ensuring the availability of some funding for it. Depending on how funds are distributed to local governments, a regional infrastructure bank, as opposed to a local or state fund pool, has the potential to concentrate on funding of construction needs which are region wide in importance, and which otherwise would not receive the same priority at the state or local level.

OVERVIEW OF FINANCING METHODS IN OTHER STATES

The federal, state, and local governments nationwide collected over \$84 billion for highway purposes and an estimated \$16 billion for transit in 1992. The sources of these funds are briefly described below.

Highways

Methods and sources used by other states for financing highway projects also include federal aid, state motor fuel taxes, motor vehicle related user fees (i.e., registrations or licenses), tolls, and bonds. Table 7-4 provides a compilation of the revenues generated in each state by source. The data has been interpreted by FHWA for purposes of comparison. Massachusetts statistics are subject to significant annual change due in part to fluctuations in federal aid as a result of the CA/T Project. The table presents the most recent federal data available and, though the numbers are unverified and outdated, it provides a general understanding of the variety of funding sources used by the states to pay for their highway improvement programs.

A growing gap between the financial needs of maintaining aging highway and bridge infrastructure and the funds available through "traditional" highway sources (such as federal funds and state taxes and fees) has motivated some states and local governments to implement more innovative methods for financing highway projects. The following are examples.

- In Virginia, a private, for-profit corporation is constructing the Dulles Toll Road Extension without any financial contribution from the public sector. The corporation will operate the roadway as a toll facility and expects to profit from the tolls collected.
- Many municipalities require developers to pay an impact fee in order to generate transportation dollars for local projects. Developers are required to pay the fee based on the estimated number of peak hour trips generated by the new development. The rationale underlying this method is that developers should help to pay for the infrastructure improvements that will be required as a result of increased traffic, or, in other words, for their fair share of the cost of infrastructure necessitated by development.

Table 7-4
State Highway Funding Sources by State - 1993

State	Federal Highway Admin.	Other Federal	Motor Fuel Tax	Motor Vehicle Related Fees	Tolls	Other State	Local Payment	Bonds	Total
Alabama	32.14%	2.50%	48.82%	16.10%	0.00%	0.44%	0.00%	0.00%	100.00%
Alaska	48.93%	0.37%	6.04%	4.62%	3.81%	36.24%	0.00%	0.00%	100.00%
Arizona	12.09%	0.37%	26.45%	13.98%	0.00%	9.99%	9.29%	27.83%	100.00%
Arkansas	33.21%	0.50%	43.50%	13.93%	0.00%	8.05%	0.83%	0.00%	100.00%
California	25.47%	0.75%	39.52%	18.09%	2.58%	1.57%	12.01%	0.00%	100.00%
Colorado	30.01%	0.87%	41.75%	15.18%	0.00%	7.74%	4.44%	0.00%	100.00%
Connecticut	19.26%	1.71%	15.35%	7.94%	0.01%	4.30%	0.12%	51.30%	100.00%
Delaware	12.04%	3.56%	11.45%	8.23%	13.17%	2.51%	0.00%	49.04%	100.00%
Dist. of Columbia	16.57%	0.28%	12.14%	16.81%	0.00%	41.78%	0.00%	12.43%	100.00%
Florida	15.95%	0.22%	23.17%	10.96%	6.79%	6.08%	2.67%	34.16%	100.00%
Georgia	30.44%	0.29%	26.76%	12.79%	0.43%	17.39%	1.12%	10.79%	100.00%
Hawaii	54.96%	0.16%	14.66%	13.03%	0.00%	5.91%	0.00%	11.28%	100.00%
Idaho	28.57%	3.83%	43.88%	23.24%	0.00%	0.00%	0.48%	0.00%	100.00%
Illinois	17.17%	0.28%	32.09%	16.71%	8.15%	3.91%	0.74%	20.95%	100.00%
Indiana	26.00%	0.14%	40.07%	10.63%	4.16%	4.97%	1.33%	12.69%	100.00%
Iowa	26.96%	0.19%	31.80%	25.48%	0.00%	15.24%	0.32%	0.00%	100.00%
Kansas	12.80%	0.20%	21.15%	6.91%	3.45%	15.78%	1.20%	38.51%	100.00%
Kentucky	11.21%	0.10%	18.24%	19.79%	0.51%	5.12%	0.00%	45.03%	100.00%
Louisiana	27.55%	0.42%	44.96%	10.02%	3.65%	3.25%	0.00%	10.13%	100.00%
Maine	25.86%	0.13%	40.80%	15.69%	11.22%	4.49%	0.00%	1.80%	100.00%
Maryland	18.10%	0.51%	20.75%	24.87%	8.07%	9.40%	0.95%	17.36%	100.00%
Massachusetts	32.21%	0.15%	17.31%	10.24%	5.79%	16.48%	0.01%	17.82%	100.00%
Michigan	23.13%	0.31%	36.67%	24.21%	0.90%	13.34%	1.45%	0.00%	100.00%
Minnesota	25.20%	0.27%	34.55%	32.45%	0.00%	4.63%	1.79%	1.12%	100.00%
Mississippi	31.19%	1.14%	41.32%	14.33%	0.00%	11.68%	0.34%	0.00%	100.00%
Missouri	30.77%	0.38%	39.26%	16.68%	0.00%	12.14%	0.76%	0.00%	100.00%
Montana	35.37%	2.45%	26.35%	7.94%	0.00%	1.53%	0.04%	26.32%	100.00%
Nabraska	26.48%	0.29%	40.34%	9.62%	0.00%	20.65%	2.62%	0.00%	100.00%
Nevada	26.05%	0.27%	50.44%	17.34%	0.00%	1.88%	4.02%	0.00%	100.00%
New Hampshire	27.37%	0.24%	29.61%	18.38%	13.24%	5.05%	1.76%	4.34%	100.00%
New Jersey	17.27%	0.14%	13.59%	10.64%	20.07%	12.77%	0.07%	25.46%	100.00%
New Mexico	34.23%	0.70%	33.83%	24.85%	0.00%	6.38%	0.00%	0.00%	100.00%
New York	18.28%	0.14%	26.40%	11.25%	13.30%	9.64%	0.00%	21.00%	100.00%
North Carolina	22.50%	0.20%	48.62%	16.19%	0.08%	11.07%	1.35%	0.00%	100.01%
North Dakota	45.55%	0.43%	30.10%	17.33%	0.00%	2.20%	4.38%	0.00%	100.00%
Ohio	22.70%	0.12%	47.84%	19.70%	3.60%	1.52%	0.49%	4.02%	100.00%
Oklahoma	24.60%	0.36%	45.04%	10.84%	11.83%	6.15%	1.17%	0.00%	100.00%
Oregon	18.80%	7.79%	39.25%	21.82%	0.29%	11.41%	0.64%	0.00%	100.00%
Pennsylvania	20.05%	0.21%	33.48%	15.32%	8.84%	3.50%	0.36%	18.24%	100.00%
Rhode Island	39.40%	0.19%	27.87%	12.79%	2.74%	0.23%	0.00%	16.80%	100.00%
South Carolina	34.10%	1.21%	53.64%	10.84%	0.00%	0.19%	0.02%	0.00%	100.00%
South Dakota	44.17%	0.89%	29.01%	11.58%	0.00%	12.48%	1.88%	0.00%	100.00%
Tennessee	21.58%	0.32%	38.80%	13.43%	0.01%	24.61%	1.26%	0.00%	100.00%
Texas	28.42%	0.31%	42.86%	19.66%	1.28%	2.24%	1.32%	3.90%	100.00%
Utah	34.90%	2.38%	45.51%	9.94%	0.06%	8.52%	0.69%	0.00%	100.00%
Vermont	41.66%	0.28%	21.96%	26.49%	0.00%	5.29%	0.17%	4.16%	100.00%
Virginia	10.41%	0.12%	28.87%	20.60%	3.60%	18.47%	1.38%	16.55%	100.00%
Washington	20.84%	1.40%	34.98%	19.67%	4.71%	2.49%	0.63%	15.28%	100.00%
West Virginia	32.16%	0.36%	27.86%	17.79%	4.49%	2.80%	0.23%	14.30%	100.00%
Wisconsin	27.02%	0.41%	42.23%	16.38%	0.00%	1.62%	2.53%	9.82%	100.00%
Wyoming	41.73%	21.51%	14.97%	12.61%	0.00%	9.05%	0.12%	0.00%	100.00%
United States	23.08%	0.62%	32.09%	15.64%	4.59%	7.88%	1.91%	14.24%	100.00%

Source: Derived from data in 1993 Highway Statistics, Table SF-1, Federal Highway Administration

- The Florida Legislature recently passed a bill providing for a local fuel tax option. It allows cities and towns to charge a fuel tax in addition to the federal and state fuel taxes to fund local transportation projects. Prior to this legislation, municipalities relied on property taxes to fund these projects. The fuel tax requires that those who drive the most pay a greater share to maintain the state's roadways.
- One revenue source that has received a great deal of attention nationally, as well as in Massachusetts, is private financing which can be applicable to a wide variety of transportation facilities and services. The results of various privatization efforts have been mixed, but a number of states, including Massachusetts, are taking major new initiatives to explore the potential for leveraging public resources with private investment.

Transit

Methods used by other states for financing transit projects include: direct income (such as fares, parking, and advertising revenue), federal aid, appropriations from the general and transportation funds, sales taxes, fuel taxes, bonds, and lottery and casino revenues. Table 7-5, developed by the American Association of State Highway and Transportation Officials (AASHTO), lists the revenue sources by state. Based on state surveys, it does provide a general idea of how transit is being paid for across the nation.

As discussed earlier, the MBTA and RTAs of Massachusetts are funded, in part, by many of the same sources, as follows:

- direct income, primarily from fares and parking;
- federal funds, through FTA and ISTEA transfers;
- local assessments, to communities that benefit from service;
- highway improvement funds, through the state gas tax and other user fees;
- general revenue funds, through general state taxes and fees; and
- municipal aid funds, financed primarily by lottery proceeds and a portion of the sales, income and other state taxes earmarked for programs that benefit local communities.

Table 7-5
Sources of Direct State Financial Assistance for Public Transportation by State,
Federal Fiscal Year 1993

State	General Fund	Transportation Fund	Sales Tax	Fuel Tax	Lottery Proceeds	Tumpike Revenue	Bond	Other
Alabama	x							
Arizona								x(1)
Arkansas								x(2)
California			x(3)					x(4)
Connecticut		x						
Delaware	x(5)							
Dist. of Columbia	x							
Florida		x						x(6)
Georgia	x							
Illinois	x						x	
Indiana			x					
Iowa								x(7)
Kansas				x				x(8)
Kentucky	x							
Maine	x			x			x	
Maryland		x						
Massachusetts	x							x(9)
Michigan			x	x			x	x(10)
Minnesota	x							
Mississippi	x							
Missouri	x							
Montana				x				
Nabraska	x			x				
New Hampshire	x							
New Jersey	x							x(11)
New York	x		x					x(12)
North Carolina								x(13)
North Dakota	x							x(14)
Ohio	x							
Oklahoma	x							x(15)
Oregon	x				x			x(16)
Pannsylvania	x				x		x	
Puerto Rico	x(17)							
Rhoda Island	x			x				
South Dakota								x(18)
Tannasse		x						
Texas								x(19)
Utah	x							x(20)
Virginia								x(21)
Washington								x(22)
West Virginia	x							x(23)
Wisconsin		x						
Wyoming		x						

Table 7-5, continued
Key to Sources of Direct State Financial Assistance
for Public Transportation

- (1) Auto registration; air quality surcharge; oil overcharge.
- (2) Arkansas Act 61.
- (3) Sales tax on gasoline and diesel fuel. State transportation bonds.
- (4) Federal funds.
- (5) Includes gas tax, toll revenues, etc.
- (6) Transportation Disadvantaged Trust Fund.
- (7) 100% use tax on motor vehicles.
- (8) State highway fund; percent of motor fuel tax to state fund; discretionary grants to seven providers.
- (9) Highway Fund
- (10) Oil overcharge funds.
- (11) Casino revenue fund.
- (12) Gross receipts; long lines; corporate franchise; investment income; special revenue fund.
- (13) The tax is only applicable for the MTA commuter district
- (14) Petroleum business tax; long lines; corporate franchise; investment income; special revenue fund.
- (15) Highway Fund; Highway Trust Fund.
- (16) One dollar annual addition to license plate fee.
- (17) State motor fuel tax can be used to match highway-related projects.
- (18) Oil overcharge fund.
- (19) Cigarette tax; In-lieu payroll tax.
- (20) Legislative appropriation.
- (21) Unclaimed agriculture gas tax rebates.
- (22) State highway fund.
- (23) Oil overcharge funds.
- (24) Highway maintenance and operations fund; mass transit trust fund.
- (25) State Senior Citizens Services Act; motor vehicle excise tax.
- (26) T.R.I.P. ticket revenue; WV Department of Health and Human Services; WV Commission on Aging.

Conclusion

In studying these and other methods of innovative financing, it is important to note that none are a panacea for the growing problem of funding transportation projects. For instance, private toll roads are not free roads. Users will have to pay a toll to use them, just as on the Massachusetts Turnpike. The only difference is that a private company, hoping to make a profit, takes in the revenue and not the state. With regard to impact fees, there is often the chance that the fee could have the unintended consequence of discouraging development in the town or state that charges the fee. And local fuel taxes place an additional burden over and above federal and state fuel taxes. In all cases, the public will pay for highway and transit improvements one way or another, regardless of how the tax is collected.

The preceding discussion is not intended to imply that alternative financing mechanisms should not be considered. On the contrary, under the appropriate circumstances, they may help to finance transportation projects where "traditional" funding is not available. However, none provide a "free ride" for the public - someone has to pay for them.

CHAPTER 8

ISTEA MANAGEMENT SYSTEMS

The stated objective of ISTEA is "the improved performance of statewide and metropolitan transportation systems through preservation, operational, and capacity improvements." One of the most important features of ISTEA is the flexibility it gives state and local officials in choosing among highway, transit, and other transportation alternatives. This flexibility is designed to help state and local officials choose the best mix of projects without being influenced by overly-rigid federal funding categories or different matching ratios which favor one mode over another.

The shift of transportation decision-making to state and local governments is accompanied by new planning responsibilities. As discussed in Chapters 4 and 5, ISTEA requires that states and Metropolitan Planning Organizations (MPOs) carry out a comprehensive transportation planning process in order to coordinate the best mix of transportation projects. To ensure that the planning process allocates resources in the most effective and efficient manner, ISTEA mandates that each state, in cooperation with MPOs, develop and implement six management systems and a traffic monitoring system to support management systems data needs.

DEFINITION OF MANAGEMENT SYSTEMS

According to the U.S. Department of Transportation's Management and Monitoring Systems Interim Final Rules, a management system is defined to be

"...a systematic process, designed to assist decision makers in selecting cost-effective strategies/actions to improve the efficiency and safety of, and protect the investment in, the nation's infrastructure. A management system includes: (1) identification of performance measures; (2) data collection and analysis; (3) determination of needs; (4) evaluation and selection of appropriate strategies/actions to address the needs; and (5) evaluation of the effectiveness of the implemented strategies/actions."

Seven systems are required:

1. **Pavement Management System (PMS):** A systematic process that provides, analyzes, and summarizes pavement information for use in selecting and implementing cost-effective pavement construction, rehabilitation, and maintenance programs for all federal-aid highways.
2. **Bridge Management System (BMS):** A decision support tool that supplies analyses and summaries of data, uses mathematical models to make predictions and recommendations, and provides the means by which alternative policies and programs may be efficiently considered for all bridges, both on and off federal-aid highways.
3. **Safety Management System (SMS):** A systematic process that has the goal of reducing the number and severity of traffic accidents on all transportation facilities by providing

information for selecting and implementing effective safety strategies and projects to ensure that all opportunities to improve safety are identified, considered, and implemented in all phases of transportation planning, design, construction, maintenance, and operation. The SMS shall incorporate roadway, human, and vehicle safety elements.

4. **Congestion Management System (CMS):** A systematic process that provides information on transportation system performance and alternative strategies to alleviate congestion and enhance the mobility of people and goods. Strategies to be considered include transportation demand management (TDM) measures, high occupancy vehicle (HOV) facilities and programs, public transportation capital and operating improvements, congestion pricing, growth management strategies, incident management, intelligent transportation systems (ITS) technology, and, as a last resort, additional general purpose capacity.
5. **Public Transportation Facilities and Equipment Management System (PTMS):** A systematic process that collects and analyzes information on the condition and cost of transit assets, e.g., maintenance facilities, stations, terminals, transit-related structures, equipment, and rolling stock, on a continuing basis in order to provide cost-effective strategies for providing and maintaining assets in serviceable condition. The PTMS shall cover all public and private transit operators receiving funding under Federal Transit Act Sections 3, 9, 16, and 18.
6. **Intermodal Transportation Facilities and Systems Management System (IMS):** A systematic process to identify and manage intermodal facilities that serve the movement of people and goods (the key linkages between one or more modes of transportation, where the performance or use of one mode will affect another), and to define strategies for improving their effectiveness. Intermodal facilities include highway elements providing terminal access, coastal and inland ports and canals, airports, marine and/or rail terminals, major truck terminals, intercity bus terminals, and major transit terminals.
7. **Traffic Monitoring System for Highways (TMS/H):** A systematic process for the collection, analysis, summary, and retention of highway-related person and vehicular traffic data, including public transportation on public highways. These data include traffic volume, vehicle classification, vehicle weight, and vehicle occupancy data associated with either a system of highways or a particular location, during a prescribed period of time.

Three of the six management systems — Pavement, Bridge, and Public Transportation Facilities — are "asset" management systems, i.e., they are designed to identify needs and develop actions in order to maintain and improve facilities and equipment, such as roads, bridges, buses, and transit stations. The other three management systems — Safety, Congestion, and Intermodal — are "performance" management systems, i.e., they are designed to identify needs and develop actions to improve the performance of the transportation system, that is, to increase safety, reduce congestion, enhance mobility, and improve connectivity.

LINKAGE TO THE PLANNING PROCESS

The results of the management systems are intended to be project- and strategy-specific alternatives for addressing transportation needs. According to the rules,

"...the results (e.g., policies, programs, projects, etc.) of the management systems shall be considered in the development of metropolitan and statewide transportation plans and improvement programs and in making project selection decisions."

Figure 8-1, taken from the rules, represents an approach for integrating, or linking, the management systems and planning processes. In effect, the role of the management systems is both to develop information and strategies to improve the performance of existing and future facilities and to provide input to the planning process for consideration at the system operation level.

SCHEDULE FOR COMPLIANCE AND POSSIBLE SANCTIONS

Implementation of the management systems was required to have begun by federal fiscal year 1995 (October 1, 1994 to September 30, 1995) according to the schedule shown in Table 8-1. Note that while there are varying final implementation dates, the first product for each system — a work plan for system implementation — was required to be completed by October 1, 1994. A work plan is defined to be a written description of major activities necessary to develop, establish, and implement a management or monitoring system, including identification of responsibilities, resources, and target dates for completion of major activities.

The state must certify annually to the U.S. Secretary of Transportation that it is implementing each of the management systems; certification statements must be submitted to the Federal Highway Administration (FHWA) Division Administrator by January 1 of each year beginning January 1, 1995. The FHWA Division Administrator must be notified in writing by September 30, 1994 of the title(s) of the certifying official(s) for each system.

Beginning January 1, 1995, if a state fails to certify annually as required, or if the federal agencies determine that any management system is not being adequately implemented, the U.S. Secretary of Transportation may withhold up to ten percent of the federal transportation funds apportioned to the state. Sanctions may be imposed on a statewide basis, on a subarea of the state, for specific funding categories or projects, or for specific fund recipients depending on the adequacy of implementation of the management systems.

COORDINATION, IMPLEMENTATION, AND OPERATION

According to the federal rule, the roles and responsibilities of the state, MPOs, transit agencies and authorities, and other agencies involved in the development, establishment, and implementation of the management systems shall be mutually determined by the parties involved. The rules specify that the state shall have the following procedures in place for coordination, establishment, implementation, and operation of the management systems:

- an oversight process to assure adequate resources are available for implementation and that the target dates are met;
- methods to ensure the use of common or coordinated reference systems and methods for data sharing; and
- a mechanism to address issues common to more than one management system.

Figure 8-1

LINKAGE BETWEEN THE
ISTEA MANAGEMENT SYSTEMS
AND THE PLANNING PROCESS

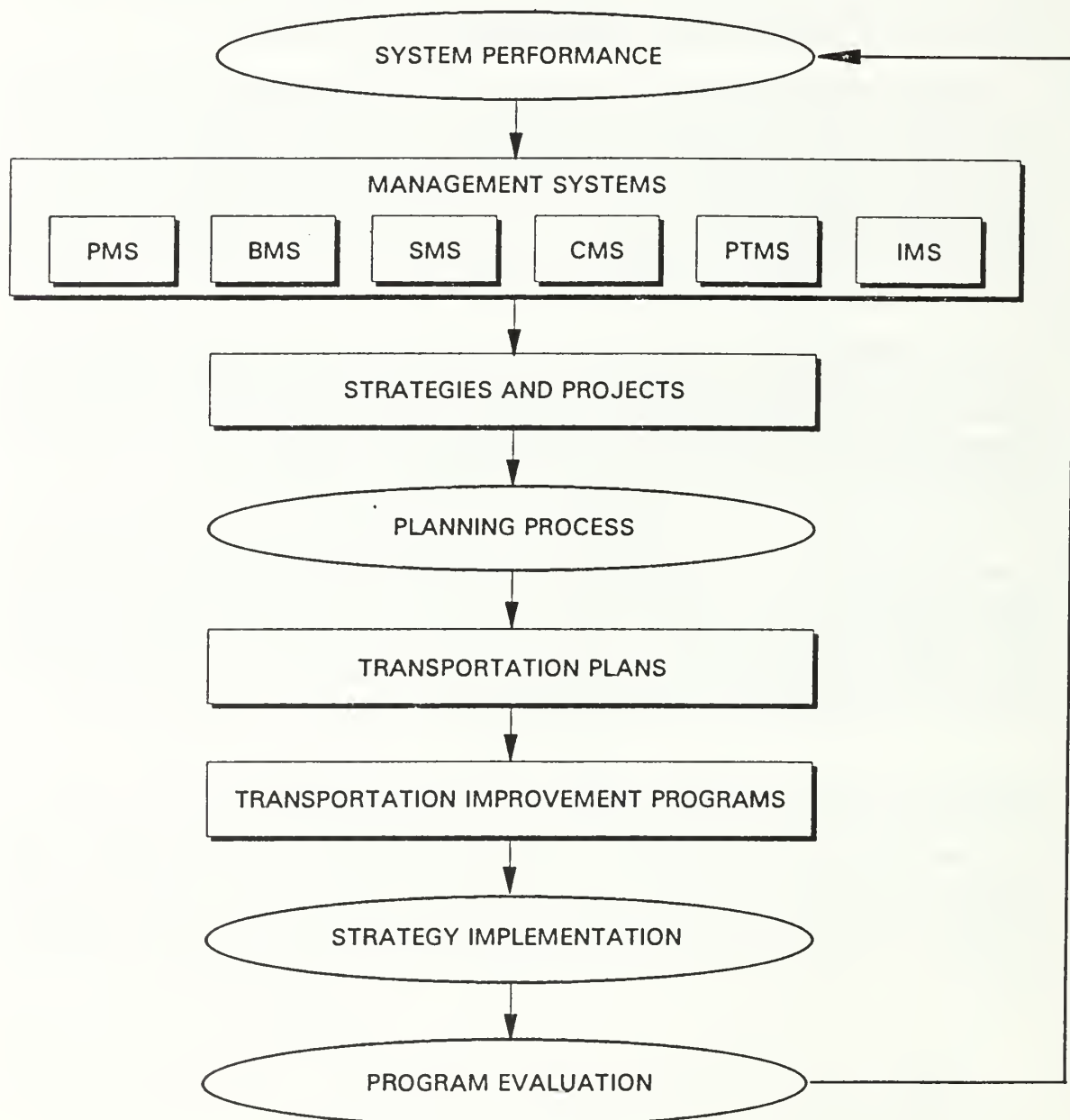


Table 8-1
Interim Final Management System Implementation Dates

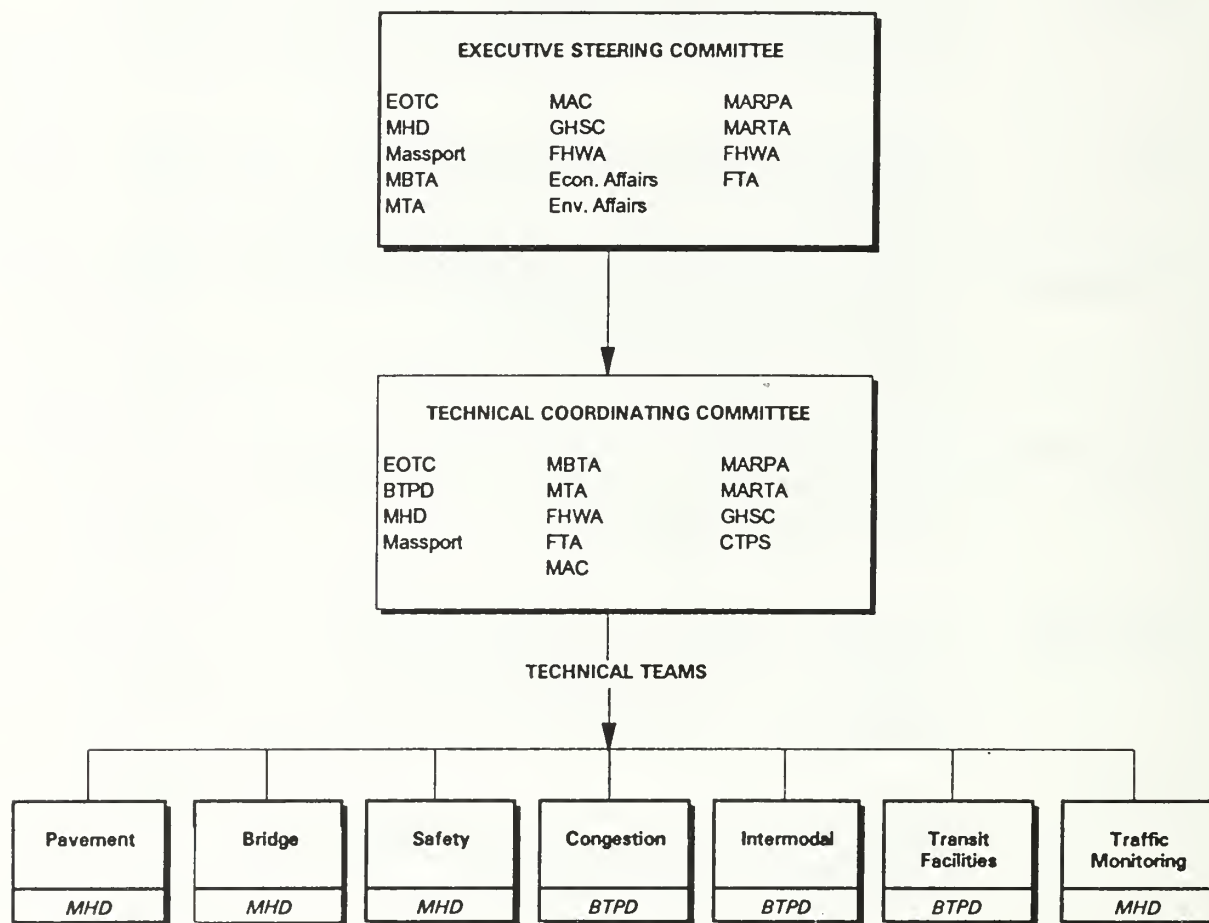
Pavement	Work plan completed	10/1/94
	Full operation on NHS	10/1/95
	Full operation on non-NHS Federal-aid highways	10/1/97
Bridge	Objectives and work plan completed	10/1/94
	System design completed and data collection underway	10/1/95
	Full operation.....	10/1/98
Safety	Work plan completed	10/1/94
	System implementation completed or underway	10/1/95
	Full operation.....	10/1/96
Congestion	Work plan completed and data collection underway	10/1/94
	Full operation in non-attainment TMAs; data collection underway in other areas	10/1/95
	Full operation in all areas	10/1/96
Public Transp	Work plan completed	10/1/94
	Condition measures and data system structure established and data collection underway	10/1/95
	Full operation	10/1/96
Intermodal	Work plan completed; facilities inventory complete	10/1/94
	Performance measures and standards established; system design complete; data collection underway	10/1/95
	Full operation.....	10/1/96
Traffic	Work plan complete	10/1/94
	Full operation on NHS	10/1/95
	Full operation on all other public highways (except local or rural minor collectors)	10/1/96

In addition, the rules specify that the state shall cooperate with MPOs in metropolitan areas, local officials in non-metropolitan areas, affected agencies receiving FTA assistance, and other agencies including private owners and operators of affected transportation systems or facilities.

To respond to Management System requirements, the Massachusetts Executive Office of Transportation and Construction (EOTC) developed a coordinated inter-agency organizational approach comprised of three components (See Figure 8-2):

Figure 8-2

ORGANIZATION FOR MANAGEMENT SYSTEMS DEVELOPMENT



Executive Steering Committee: This committee, composed of high-level representatives of various agencies, is responsible for policy direction, oversight, and resource allocation.

Technical Coordinating Committee: This committee reports to the Executive Steering Committee and serves to coordinate the efforts of organizations involved in development and implementation of the management systems through coordination of the seven technical groups.

Management Systems Technical Teams: Seven technical teams (one for each management or monitoring system) report to the Technical Coordinating Committee. Each technical team has primary responsibility for developing and implementing its management system in coordination with the other technical teams.

These groups began meeting in December, 1994, and will continue to meet through the systems' implementation phase.

Preparation and Submittal of Management System Work Plans

Draft work plans for each of the seven systems were prepared by the respective technical teams and submitted to the Executive Steering Committee for agency review in early September 1994. After Executive Steering Committee and agency review, the work plans were finalized and submitted to FHWA, FTA, and the National Highway Traffic Safety Administration on September 30, 1994.

Transmittal of Certification Letter

In accordance with federal requirements for annual certification, the Secretary of the Executive Office of Transportation and Construction, as the Governor's designee, transmitted a letter to FHWA on December 28, 1994, certifying that Massachusetts is in the process of implementing each of the six management systems as well as the traffic monitoring system. Included in the transmittal were the work plans as well as a summary of the status of the implementation of each system.

Use of Coordinated Reference Systems and Means of Data Sharing

The Technical Coordinating Committee agreed that the use of coordinated locational reference systems is a key factor in the ability to share data between and among management and monitoring systems. They agreed further that the primary means of accomplishing this objective is the use of Geographical Information Systems for the storage and analysis of locationally referenced data, and the use of a consistent base digital map. It was decided that the current highway coverage, developed and maintained by the Bureau of Transportation Planning and Development, will serve as the basis for development of GIS data coverages for all of the management systems.

CONCLUSION

Each of the management systems will provide, at a minimum, a systematic identification of problems that need to be addressed and possible strategies for solving these problems. These strategies may take the form of proposed projects or they may suggest the need to conduct a study of a particular problem on a corridor or sub-area basis.

All strategies that are outputs of the management systems will become inputs to the transportation planning process. Addressing the problems in a systematic way using management systems helps to ensure a more comprehensive planning process. The coordinated development of the systems means there will be greater access to the data that will be vital to making infrastructure investment decisions.

Accessing the Future

Part Three: Regional Transportation Plans

Chapter 9: Regional Transportation Plan Summaries

CHAPTER 9

REGIONAL PLAN SUMMARIES

This chapter contains summaries of regional transportation plans adopted by each of the thirteen Massachusetts planning regions:

- Berkshire County Metropolitan Planning Organization
- Boston Metropolitan Planning Organization
- Central Massachusetts Metropolitan Planning Organization
- Franklin County Commission
- Martha's Vineyard Commission
- Merrimack Valley Metropolitan Planning Organization
- Montachusett Metropolitan Planning Organization
- Nantucket Planning and Economic Development Commission
- Northern Middlesex Metropolitan Planning Organization
- Old Colony Metropolitan Planning Organization
- Pioneer Valley Metropolitan Planning Organization
- Southeastern Region Metropolitan Planning Organization

These plans were formally adopted in October, 1993, in response to ISTEA metropolitan planning requirements. As discussed in Chapter 4, the planning rules require regional transportation plans to be project-specific, consider the 15 required metropolitan planning elements, and conform to the State Implementation Plan for clean air. The planning rules also require that the regional plans must be updated at least every three years. Each plan summary consists of six sections:

- Regional Profile.
- Regional Goals.
- Existing Conditions.
- Future Conditions and Problem Identification.
- Environmental and Other Issues.
- Recommendations: Programs and Projects.

Because of the inconsistent ISTEA planning rule deadlines for adoption of regional and statewide transportation plans, the 1993 regional plans were developed prior to the completion of *Accessing the Future*. But the regional transportation plans, as well as the participation of the regions in the development of *Accessing the Future*, provided a framework for the policies, goals, and objectives contained in this Plan. In turn, it is envisioned that the policies, goals, and objectives outlined in *Accessing the Future* will guide the selection of the programs and projects included in future regional transportation plans.

BERKSHIRE COUNTY REGIONAL PLANNING COMMISSION (BCRPC) REGIONAL TRANSPORTATION PLAN SUMMARY

Federal regulations require an adopted regional transportation plan as a condition for funding of transportation improvements. The purpose of the plan is to ensure that various transportation projects are consistent with the area's overall development policies and are coordinated with one another to provide an effective transportation system which makes efficient use of available funds.

REGIONAL PROFILE

Berkshire County is comprised of two cities and thirty towns and has an area of 606,180 acres or 947 square miles. Elevations range from 3,491 feet at Mount Greylock, the highest point in the State, to 594 feet in Williamstown on the Hoosic River. Two main rivers drain the county, the Hoosic in the north and the Housatonic in the south.

The 1990 United States Census recorded 139,352 persons, a decrease of 4.0 percent from 1980. Nearly 97 % of the region's population is white; the majority of the remaining population (1.8%) is black. Eighty-five percent of the Berkshire area is predominately rural. There has been a recent decline of manufacturing and an increase in the service sector.

Nearly half of the total population is concentrated in two urban municipalities, Pittsfield with a 1990 population of 48,622 and North Adams with 16,797. In 1990, the labor force totalled 69,963 with an unemployment rate of 6.7%. The region's largest enterprise is the Martin Marietta/GE industrial complex in Pittsfield, employing about 4,300 workers in 1990. Per capita income in Berkshire County was \$14,857 in 1989.

REGIONAL GOALS

Over a period of time, transportation goals and objectives for the region have evolved from a number of efforts, notably by the Transportation Advisory Group, the Berkshire County Regional Planning Commission (BCRPC), and local growth policy statements. There is generally widespread support and agreement for these goals and objectives. The primary goal is to provide for the safe, economical, efficient, and convenient movement of people and goods over a balanced multimodal transportation system compatible with the socio-economic and environmental characteristics of the region. Objectives for achieving this goal are to minimize traffic congestion; improve public safety; improve mobility within the region; improve access to areas outside the region; provide transportation improvements to meet commercial and industrial needs; provide transportation improvements to accommodate recreational traffic; to preserve scenic routes while minimizing conflicts between the dual function of roads to provide both mobility and access to property; and maintain a continuing transportation planning process.

EXISTING CONDITIONS

Although the total population has declined in the region, transportation demands have grown. This is due to increases in total households, population dispersal, and employment, all of which have increased faster than total population.

Highways

The Berkshire County highway system consists of almost 2,000 miles of roadways, 10% of which are arterials carrying more than half of all vehicular traffic. The major highways are Routes 7 and 8 running north-south in the county. The Massachusetts Turnpike (I-90) carries interstate traffic east-west into and through the region.

It is estimated that the highway system served 532,000 vehicle trips per day in 1990 for a total of 3,200,000 vehicle miles of travel per day. The vehicle trips generally consist of 90% automobiles, 10% trucks, and less than 1% buses. The vehicle miles of travel consists of 85% autos, 15% trucks, and less than 1% buses. The highway system carried 700,000 passengers per day in 1990 for an average of 6.0 miles per passenger trip.

Problems with traffic flow are due to various factors related to congestion and accessibility. These problems occur primarily in the more densely developed communities such as Pittsfield, North Adams, Lee, Lenox, Adams, and Williamstown. While congestion results when demand exceeds the capacity of the road, other factors also contribute to delays such as a poor highway network, poorly designed highways, conflicting highway uses, and the nature of traffic itself.

Bridges

Substandard bridges are a deficiency in the transportation system which is noticeable throughout the region. Years of neglect and lack of maintenance have left many bridges in poor condition, particularly those previously owned by railroads. It is not legally possible for a legally loaded truck to reach the interstate system from some areas because of the lack of adequate bridges. Twenty-three of the most substandard bridges in the county have been identified.

Parking

Adequate parking supply is a very important problem in urban areas and town centers. The lack of parking spaces contributes to the relocation of stores and offices out of the urban centers into outlying areas where there is ample land for free parking. This trend of business relocation conflicts with current efforts to revitalize existing downtown centers and with regional growth policies and objectives.

Pedestrians

The pedestrian environment is also of concern in downtown centers, particularly as it relates to safety and ease of movement. Many pedestrian/vehicular conflicts are found in built-up areas where a large

number of pedestrians must cross heavily travelled streets. In addition, many heavily travelled streets do not have sidewalks, and pedestrians and joggers must use the street itself. These conflicts hinder auto and truck traffic as well as create safety problems for pedestrians. Pedestrian/vehicular conflicts are also a problem in residential neighborhoods where those streets are used by vehicles to bypass more congested urban roadways. In addition, with Berkshire County's variable weather, pedestrians often find themselves exposed to the harsh elements - wind, rain, snow, etc. Here again, such circumstances are in conflict with current public policies to revitalize downtowns and make them more attractive to businesses and their patrons.

Bikeways

While extensive travel by bicycle is made difficult by many steep grades and often inclement weather, this activity is popular for recreation as well as general transportation, particularly by youngsters below driving age. However, safety problems result when bicycles must use narrow, heavily travelled arterial and collector roads without adequate shoulders or sidewalks.

Buses

The bus system in Berkshire County includes, local transit service from Williamstown to Great Barrington operated by the Berkshire Regional Transit Authority (BRTA), regularly scheduled intercity buses operated by several major bus companies, and school buses. Of the estimated 3% of all passenger trips served by buses during 1990, 14% were served by the BRTA's 14 buses, about 3% by approximately 20 intercity buses, and the remainder, 83%, were served by almost 300 school buses.

With a basic fixed route system established in the BRTA area in terms of new buses on new routes, remaining transit problems here are related to funding. This is a serious problem which threatens to result in the dismantling of the already small Berkshire Regional Transit Authority system. Existing paratransit services are also threatened by cutbacks in federal transit subsidies.

Rail

The maintenance of rail service in Berkshire County is important primarily for freight. While the main east-west line has been rehabilitated, the secondary feeder lines are not in as good condition. Most of the northern branch line has recently been abandoned altogether.

Intercity rail passenger service is currently being provided daily by AMTRAK on its "Lakeshore Limited" route from Boston to Chicago through Pittsfield. While the service could be useful for trips to Boston for shopping or business, the schedule is such that one cannot reasonably expect to travel to Boston and return the same day. The trains are also, at times, behind schedule by an hour or more.

There is also interest in re-establishing rail passenger service to New York City. However, in 1987, an extensive consultant study concluded that such service would not be viable because of insufficient ridership and the extensive public subsidies that would be required.

Air

Although three airports in the County provide general aviation service, normally there is no scheduled passenger service. A major problem with these facilities has been the noise impacts on nearby land uses. This occurs because of airport usage growing slowly over time with runway expansion and the use of jet aircraft. At the same time, recent residential development has occurred within the sound range of the flight path. In addition, ground access to the Pittsfield Airport is poor, being very indirect and roundabout over narrow roads; in spite of the "airport connector" road recently constructed by the state.

FUTURE CONDITIONS AND PROBLEM IDENTIFICATION

The BCRPC uses a state-of-the-art economic/demographic simulation model to produce standardized population projections for Berkshire County which are used for all functional planning including transportation. These forecast a recovery from the recent population decline. Berkshire's 1990 population of 139,352 is projected to grow to 147,700 by the year 2020.

Although the regional decline in population is expected to slow and then gradually rebound, transportation demands are expected to out pace population growth. In the year 2020, the projected number of households will be almost 16% higher than 1990, and the number of vehicle trips is expected to increase by almost 13%. Due to these expected increases in traffic, problems such as congestion, conflicts between pedestrians and vehicles, accidents, truck traffic, and vehicles using residential streets as short-cuts are expected to worsen.

ENVIRONMENTAL AND OTHER ISSUES

Transportation is a large component of the air quality problem. Vehicle emission rates are a function of the total amount of traffic, the speed of traffic, the amount of stop-and-go traffic, the types and ages of vehicles in the street, and the air temperature. The major pollutants of concern with regard to transportation are carbon monoxide (CO), and hydrocarbons (HC) which break down to form ozone. Since Berkshire County has been designated as a "non-attainment" area, hydrocarbon emissions are of primary concern. The goal then is to reduce transportation-related air pollutants through transportation control measures (TCMs) which will improve traffic flow and vehicle operating efficiencies.

RECOMMENDATIONS: PROGRAMS AND PROJECTS

The programs and projects that follow represent the Region's transportation agenda for the future.

Corridor Preservation

Since right-of-way acquisition for large construction projects creates considerable difficulties for landowners and relocatees, it would be desirable to set up a program for advanced acquisition of rights-of-way for major, long-range construction projects. Property could be acquired as it is put up for sale. In addition, the state should have the option either to authorize local building permits within the corridor or to buy the property. These methods could also be extended to include existing arterial highways. This would involve the land adjacent to the highway and could avoid the occurrence of strip-developments.

Preservation of the scenic aspects of the Berkshire County is important for the residents' quality of life and the economic attractiveness of the area for both tourism and new businesses. This can be done by a combination of techniques including, land use controls to minimize strip development, removal of illegal billboards, designation of scenic roads to preserve features such as: stonewalls, trees, and acquisition of adjacent land, as well as sensitive highway engineering and appropriate landscaping.

Pittsfield

More than a decade ago, after careful examination of available data and information, alternatives to the transportation problems of this area were narrowed down from 14 to 2 by the Transportation Advisory Group (TAG). The majority view favored a Western Bypass, while the minority favored street improvements. Currently, the state's new task force is reviewing the needs and alternatives in order to ascertain sentiment on the subject.

Route 8 Corridor

Alternative Route 8 alignments have been identified by the State. Consideration should be given to the feasibility of using the recently abandoned railroad right-of-way for a possible relocation of Route 8. A corridor study is needed to determine the most appropriate solution for this problem area.

Route 7 and 20 (Massachusetts Turnpike Access)

Alternative solutions for Lee's congestion problem have been identified. These alternatives include improving existing streets or diverting traffic with new roads and/or new interchange locations. The most expeditious of these alternatives appears to be the relocation of the Massachusetts Turnpike toll barrier in West Stockbridge to a new location east of Route 7. This alternative is the least expensive, presents few engineering problems, and has relatively little environmental impact.

North Berkshire

Transportation improvements that would contribute to the revitalization of the City of North Adams include upgrading of intersections, rehabilitation of substandard bridges, and provision of off-street parking. Previous reports have identified alternative solutions for Route 2 and one of the most notable recommendations is to minimize the increase in driveway entrances. Corridor preservation would help

to alleviate this problem and would ultimately be less expensive than building a new road when the existing road becomes thoroughly congested.

South Berkshire

The problem in South Berkshire Village could be alleviated by routing the traffic around the center of Stickbridge via a new bypass road.

Coltsville

Major solutions to traffic problems at the Coltsville Shopping Center would likely involve some sort of grade-separated interchange or a new roadway to bypass the intersection of Routes 8 & 9 in Northeast Pittsfield. Consideration should be given to the potential of using the secondary branch railroad right-of-way from Merrill Road north to the Lanesborough line.

Multimodal Transportation Terminal

The City of Pittsfield is the focal point of activity in the Region and the downtown is the focal point of activity in the City. A multimodal transportation terminal would be a valuable addition to the various activities in the revitalization of the central business district.

BOSTON METROPOLITAN PLANNING ORGANIZATION (Boston MPO) REGIONAL TRANSPORTATION PLAN SUMMARY

The Boston MPO prepared its 1993 long-range Plan in order to meet the challenge of preserving and expanding a truly intermodal transportation system for the Boston Region, consistent with the requirements of ISTEA. The principal role of the Transportation Plan is to identify goals, policies, and investments to support a balanced multimodal system.

The Plan specifies the goals and policies for the regional transportation system. It presents a comprehensive set of goals and policies for the various transportation modes, and identifies how the transportation system should help to support economic development, reduce air pollution, and provide physical accessibility. The plan assesses how each mode functions individually and then how it fits into the overall transportation system. It contains a summary of system-wide operating statistics, as well as background information on the components of the regional transportation system: highways, transit, rail, ports, air travel, freight movement, and bicycle and pedestrian travel.

The Plan also estimates future transportation needs and fiscal resources. It describes future conditions and identifies opportunities that will be available for decision makers and contains a financial element that examines the resources expected to be available to fund improvements.

Finally, the Plan presents recommendations to improve the transportation system and to address the multiple requirements enumerated by federal and state laws and regulations. Environmental responsibility, a hallmark of these regulations, is expressly addressed. The recommendations presented in the Plan emphasize preservation of the existing system. They also consider environmental, economic development, and intermodal needs within a financially feasible program. This acknowledges that transportation systems are not designed for a single function but for many parallel ones: commuting, freight movement, economic development, emergency services, recreation, and tourism, among others.

REGIONAL PROFILE

The Boston Metropolitan Planning Area is comprised of 101 cities and towns bounded by the Atlantic shore and roughly encompassed by Interstate 495. Along the coastline, the regional limits extend as far north as Ipswich and as far south as Duxbury.

The Region is the largest in the Commonwealth of Massachusetts, containing almost half of the state's population. The Boston Metropolitan Area also accounts for more than two thirds of the state's employment base.

The City of Boston is the economic center of the metropolitan planning area. It draws workers from around and beyond the Region. Each weekday, 607,000 work trips are made to Boston and Cambridge, representing 35.3% of all work trips made within the Region.

The diverse nature of the Region is related to its population and land use characteristics. An influx of Asian, Hispanic, and black immigrants into the Region has contributed to a population increase in the oldest cities. Meanwhile, the suburbs have experienced little or no population growth, except in the towns along the Interstate 495 belt where the availability of land, less expensive housing, and a strong potential for job growth exist.

The diversity of its population, commercial services, and industry are clear proof of the Region's ability to successfully compete in the global marketplace.

REGIONAL GOALS

The 1993 Transportation Plan for the Boston Region articulates a transportation vision for the metropolitan area and then establishes goals and policies for accomplishing this vision:

"It is the vision of this Transportation Plan to maintain, manage, and operate a multimodal transportation system in the Boston Region that provides a high level of mobility for all people and economic activity consistent with environmental and fiscal resources."

In the twenty-five years covered by this Plan, the Boston Metropolitan Planning Organization (MPO) will seek to carry out this vision of a balanced and affordable transportation system that sustains the economic vitality of the Region. The Plan advocates six goals which have been based on the vision statement and on information provided in federal and state legislation, as well as plans and recommendations developed by Massachusetts and its regional agencies.

1. Establish the framework and guidelines for decision-makers to use when selecting among projects, programs, and facilities that meet different and sometimes conflicting objectives. This framework should include measures to ensure that limited financial resources are used in the most effective manner.
2. Ensure the mobility of people and goods by implementing repair/maintenance programs, transit capacity improvements, intelligent vehicle systems, and congestion management programs which increase highway capacity for single-occupant vehicles only when no better alternative can be found.
3. Use investments in transportation infrastructure to improve the economic and environmental sustainability of the Region by supporting existing and planned mixed-use development concentrations.
4. Improve the economic competitiveness of the Region by encouraging the location of new development in urban cores, thereby best utilizing existing infrastructure while protecting natural resources and providing increased economic opportunities to all the Region's citizens.
5. Minimize the costs in time and money of transporting people and goods in the Region.
6. Ensure that the transportation program adequately meets appropriate legal mandates governing transportation investment and environmental protection.

EXISTING CONDITIONS

Even taking into account the existing deficiencies within the Region's system, the Boston metropolitan area is well served by its transportation network. The transit system complements the highway network; Boston harbor provides safe transit for most forms of water borne transport; and Logan airport serves as an important passenger and freight link to the Region and the world. Intercity rail provides frequent service to points south and west. The close proximity of locations within the Boston core allows for ease of movement by pedestrians and bicyclists.

While a discussion of each mode is presented independently in the Plan, there is a recognized need to develop an interdependent system of travel that contains efficient intermodal connections. Boston is a major transportation connection point both within the New England area and to other parts of the world. Intermodal facilities such as Logan Airport, Boston Harbor, the Massachusetts Turnpike, the Massachusetts Bay Transportation Authority (MBTA), Fort Devens, the local highway network, and intercity passenger and freight rail lines all provide a high level of transportation connections within the Boston area.

Highways

In order to address the problems of congestion on the roadways, the Massachusetts Highway Department (MHD) has a number of ongoing projects to encourage the use of alternative travel options and to increase the number of passengers per vehicle. Efforts include transportation demand management (TDM) strategies, HOV lanes, park-and-ride lots, support to programs such as CARAVAN, incident management, the "SP" program and SmarTraveler. The ISTEA management systems will help program projects necessary to maintain adequate pavement, safety, and bridge conditions.

Transit

The public transportation system in Greater Boston is composed of four primary modes: rapid transit (including light rail), railroad, bus, and boat. Each of the four modes developed independently.

The MBTA rapid transit and light rail systems are composed of 125 stations on four lines: the Red Line, the Orange Line, the Blue Line, and the Green Line. All lines provide service to downtown Boston and all lines directly connect with each other, except for the Red and Blue lines. Daily ridership on the rapid transit/light rail system is approximately 562,000 trips per weekday.

The MBTA operates 159 bus routes throughout the MBTA district, including four trackless-trolley lines in Cambridge, Watertown, and Belmont. In FY 1991, total bus ridership was approximately 360,000 trips per weekday. Nearly all routes connect with the rapid transit system at least at one location. In areas closer to Boston, buses provide crosstown service, feeder service to rapid transit stations, and line haul service in heavily congested areas. The MBTA operates express bus routes service from 11 communities. In 1991, typical weekday boardings on all express routes totalled 25,300 trips.

The 265-mile commuter rail network is composed of 11 radial lines with 101 stations, 39 of which are wheelchair accessible. In FY 1991, daily ridership was approximately 74,600 trips per day. Existing deficiencies within the transit system include accessibility; ensuring adequate funding to maintain the infrastructure of the existing system; alleviating congested sections of the system; and improving intermodal connections.

Rail: Intercity Passenger and Freight

The Boston Region is served by an extensive network of freight and intercity passenger railroad operations. Freight rail service is provided by a number of carriers, and intercity passenger service is provided by Amtrak.

The two predominant freight rail carriers in Eastern Massachusetts are the Consolidated Railroad

Corporation (Conrail) and the Boston and Maine Corporation (B&M). An existing constraint to efficient freight movement is the lack of proper bridge clearance for the shipment of double-stack railcars. The state is working with the rail carriers to address this problem.

Pedestrian and Bicycle Facilities

The Boston metropolitan area is currently served by a number of bicycle/pedestrian paths maintained by the Metropolitan District Commission, the City of Boston, the MBTA, and local communities. The longest facility is the Minuteman Commuter Bikeway. The Charles River (Paul Dudley White) Bike Paths, which form a 14-mile loop from Watertown to Cambridge and Boston, are located on both sides of the Charles River.

According to the U. S. Census, communities with a bicycling mode-split over 1% are Cambridge (3.05%), Somerville (2.01%), and Brookline (1.83%). Communities with Census-estimated walk shares over 10% are Cambridge (25.02%), Wenham (17.29%), Boston (14.28%), Wellesley (12.01%), Brookline (11.88%), and Somerville (10.93%).

Air: Passenger, Freight, and Ground Access

Logan International Airport provides extensive air connections for both passenger and freight movement in the Boston Region. It serves both domestic and international flights, cargo shipments and general aviation aircraft. Logan is the tenth busiest passenger airport in the world handling about 23 million passengers in 1990. The airport handled about 680 million pounds of cargo in 1990.

The airport is located on 2,400 acres of land across Boston Harbor from downtown Boston. The urban location of the airport and its proximity to downtown Boston makes it convenient by both rapid transit and water transit. At present it is served by a stop on the Blue Line and a water shuttle from Rowes Wharf with shuttle bus links to the terminals. For suburban areas, Massport operates express bus service from Framingham, Braintree, and Woburn. The planned MBTA Airport station renovations will provide improved transit access to Logan Airport.

Water: Ports, Harbors, and Inland Waterways

The Boston metropolitan area is fortunate to have a number of port facilities that support shipping, as well as fishing, water transportation, and maritime recreational needs. Deep water ports with good rail and highway access are a scarce resource. To protect this resource, the Massachusetts Coastal Zone Management established nine areas within the Boston MPO Region as Designated Port Areas.

The marine terminals of Boston Harbor provide facilities for passenger ferries and ships, fishing vessels, bulk freight, break-bulk freight, and containerized cargo vessels. New small vessel docking facilities in the harbor, such as at Rowes Wharf and Long Wharf, have increased docking space for commuters and recreational users of the waterways.

Commuter passenger boat service operates between Hingham and Rowes Wharf (Boston), between Rowes Wharf and Logan Airport, between the Charlestown Navy Yard and Long Wharf (Boston), and from Point Pemberton in Hull to Rowes Wharf.

Recent infrastructure improvements by Massport to its terminals have increased the capacity for handling ocean-going cargo and passenger vessels. Massport operates a number of the port facilities in the harbor. In addition to Massport facilities, the harbor contains numerous private terminals and cargo facilities that handle most of the bulk cargo, including oil products, liquified natural gas, salt, and cement. In 1992, over 16,350,000 tons of cargo were shipped through the Port of Boston in over 2,000 cargo vessels. The major bulk commodity in the Port is petroleum. The petroleum tank farms along the Chelsea Creek supply over three-quarters of the home heating oil and over two-thirds of the gasoline for the Region.

The major deficiencies that currently restrict port operations are; the need for dredging in parts of Boston harbor; the need for increased cargo off-loading capacity; the need for improved intermodal connections (rail and highway); and the need for alterations to the Chelsea Street bridge.

FUTURE CONDITIONS AND PROBLEM IDENTIFICATION

The changing shape of the Boston urban area has implications for its transportation system. Once, the standard metropolitan development pattern consisted of a central business district ringed by residential suburbs. Suburb-to-central city work trips were efficiently served by "hub and spoke" transit lines that converged downtown. But suburban development now includes commercial and industrial uses.

The forecast for the 2020 Base Case estimates that auto person and transit passenger trips will increase by about 11%, but highway vehicle trips will increase by more than 17%. This is attributed to continued decreases in auto occupancy. Vehicle miles of travel (VMT) in the 2020 Base Case are forecast to increase by approximately 25%, far greater than the increase in highway vehicle trips. Much of this increase in VMT is due to longer distance trips. Over the forecast period, this is an annual growth rate of about 0.9%. Vehicle hours of travel (VHT) are forecast to grow by 35% in the Base Case, evidence of growing system wide congestion.

Despite the increases in VMT and delay estimated by the 2020 Base Case, emissions are forecast to diminish. This reflects the benefits of centralized, enhanced vehicle inspection and maintenance; use of reformulated fuel; and an increase of cleaner vehicles in the vehicle mix

The following sections describe the roles that each of the various improvements to the transportation system will play in the future of the Region.

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The Role of the Central Artery/Third Harbor Tunnel

The Central Artery/Third Harbor Tunnel project is designed to improve access to and through downtown Boston. It will completely replace the 6-lane elevated section of the I-93 Central Artery with a depressed 8 to 10-lane roadway roadway with new connections from the Central Artery to I-93 North and Route 1 North. The Massachusetts Turnpike will be extended to Logan Airport by way of a new 4-lane Seaport Access Road extending from the present terminus to the Third Harbor Tunnel.

The Future Role of Highways

The regional highway system will continue to carry the vast majority of person-trip travel and will be an important part of the freight movement system. Roads will also be the routes for buses, carpools, and vanpools, making the highway network an integral part of the public transportation system. If the highway system is to continue to provide reasonable service throughout the Regional Plan period, it is essential to keep it well-maintained. It is also important to plan for capacity increases only where future traffic will exceed capacity and where highway expansion is determined to be the best solution.

The Future Role of Transit

The advanced age of many components of the transit system means that preservation and reinvestment will be needed to keep it running efficiently. Future challenges consist largely of maintaining and upgrading the existing system. In addition, some selected expansions and improvements will be desirable to make the individual components of the system work together better.

The Program for Mass Transportation (PMT) is the capital program for the Massachusetts Bay Transportation Authority. The objective of the PMT is to identify and recommend projects that will result in a cost-effective mass transit system that serves the greatest number of people in a way that respects the environment and enhances responsible economic development. Among the goals of the PMT are

- preservation of the Existing System;
- accessibility Improvements (ADA- Related Projects); and
- SIP and CA/T Mitigation Projects.

The Future Role of Rail Freight

Boston was founded as a port city and much of its growth has stemmed from international trade. Marine port facilities are just the gateway, however, to a national (and international) goods movement network made up of highways and railroads. While cartage by truck will remain an important component of a competitive and multimodal freight network, an efficient high capacity freight rail system is also essential to ensure the seamless movement of goods between the Port of Boston and markets and manufacturers in the Northeast and the Midwest.

The Future Role of Pedestrian and Bicycle Travel

The Boston Region MPO recognizes that increased bicycling and walking can reduce traffic congestion, air and noise pollution, and fuel consumption. Thus, these two modes effectively contribute to the quality of life in the Region.

Various improvements and expansions to the regional bicycle system are under study. These include connecting the Minuteman and Charles River facilities, conducting a bike-to-the-sea feasibility study, and improving region-wide bicycle and pedestrian access to transit facilities.

The Future Role of Air Travel

The growth in air travel, both passenger and freight, experienced in recent decades is expected to continue into the future. A study commissioned by Massport forecast passenger volume of 37.5 million for the year 2010, a 63% increase over the 1990 volume of 23 million.

The Future Role of Ports and Water Travel

Progress in international trade talks, the consolidation of the European market, and a shift in the locus of manufacturing within the Pacific Rim which will create a shorter trade route via the Suez Canal to the eastern United States, all point to an increased role for the port of Boston in the coming years. Boston is the closest major American port to Northern Europe - a full day closer than New York in sailing time. With improvements to the land-side freight system, Boston can offer a real time advantage in moving goods to and from inland markets.

The preceding discussion of the components of the regional transportation system helps to frame the choices that must be made in this plan. The system is mature and will require regular investments to preserve its capabilities, but there will be opportunities to improve efficiency through the use of technology and increased emphasis on intermodal operations. Other additions like bikeways and HOV lanes, will assume greater importance in the future system.

The MPO analyzed a series of transportation and land use scenarios in an effort to identify projects that would best correspond to the travel needs and environmental considerations described in this chapter and the preceding one. In order to help identify the most balanced and effective set of projects for this plan, the MPO performed seven different transportation and land use model runs for the year 2020. The analysis examined the relationship between land use and transportation; evaluated system-wide air quality impacts; and estimated system-wide delay.

ENVIRONMENTAL AND OTHER ISSUES

ISTEA reinforces the need to incorporate environmental values in the transportation planning process. Moreover, ISTEA complements other federal environmental legislation such as the Clean Air Act, the Clean Water Act, and the National Energy Policy Act. Protection of the environment should be considered a priority from the inception of a transportation project or program to its completion and operation. The Boston MPO is committed to full support of federal and state environmental laws. The Boston MPO's support for proper environmental practices fits into the overall EOTC commitment to full compliance with environmental regulations, within its statewide mission of providing cost-effective transportation systems. The Transportation Plan's four key environmental goals and policies are to:

1. Reduce air pollution to achieve and maintain the national ambient air quality standards (NAAQS)
2. Encourage the use of low-pollution fuels and engine technology
3. Use transportation-enhancement activities to preserve and improve the natural and built environments, making communities and the Region more healthy and attractive
4. Minimize water, soil, and noise pollution

The Boston MPO agencies are committed to using all practicable means to limit the adverse environmental impacts from existing and new transportation projects or programs proposed in this Transportation Plan. This is done through compliance with the Massachusetts Environmental Policy Act

(MEPA) and the National Environmental Policy Act (NEPA) regulations. The environmental chapter discusses issues and programs related to bicycle and pedestrian programs, air quality, water quality, land use, open space, transportation enhancements, and energy conservation.

RECOMMENDATIONS: PROGRAMS AND PROJECTS

The recommendations in this Transportation Plan have been chosen on the basis of four priorities: 1) preservation of the existing system, 2) compliance with clean air goals, 3) continued enhancement of system accessibility, and 4) expansion of the system consistent with the Plan's policies and goals.

Central Artery/Third Harbor Tunnel

The Central Artery/Third Harbor Tunnel Project is the largest public works project in the history of the United States; when complete, it will be the final link in the nation's Interstate Highway System. This massive project will dominate the transportation agenda of Massachusetts into the next century. The engineering, construction, and financing challenges of this project are extensive and will continue to demand careful scrutiny and management by the Commonwealth.

This project will give metropolitan Boston a modern, efficient, and state-of-the-art highway system. The Central Artery/Third Harbor Tunnel project will provide vital intermodal connections between the busiest port, airport, and transit system in New England. Pedestrians and bicyclists will access the broad, tree-lined boulevards and the hundreds of acres of park land that will be created by the demolition of the infamous "green monster". Economic forecasts project that the enhanced mobility resulting from this project will increase productivity through reductions in wasted time due to travel delays.

North Station-South Station Rail Link

A North South Rail Link is being studied as part of the Northeast Corridor which would extend Amtrak service to Portland Maine. It would be constructed under the underground Central Artery and would help promote intersuburban commuter rail. Currently, passenger railroad service, both intercity and local, is provided by two physically isolated systems. The project would include three stations: South Station, North Station, and a new Central Station. This would allow for the full integration of all the commuter rail lines.

LOGAN 2000

Massport is embarking on a major reconstruction of airport facilities to improve passenger access and mobility. Existing terminals and support facilities are over 25 years old and require major upgrading or replacement. Transit access will be improved by a new people mover system which will link the terminals to each other and to the Airport MBTA station. In addition, the Third Harbor Tunnel entrance and approach roadways are being constructed through the airport with the promise of improved access to and from the airport as well as improved ground transportation throughout the airport. The confluence of these factors has furnished the challenge and the opportunity to reinvent Logan International Airport as an intermodal transportation center for the 21st Century.

Intelligent Transportation Systems

Management of transportation systems in the future will incorporate the use of advanced computer, electronics, and communications to integrate activities for the entire surface transportation system. These intelligent transportation systems (ITS) will utilize a full range of technologies to develop a truly intermodal system that offers user services in the areas of travel planning, traveler information, travel management, travel payment, commercial vehicle operations, emergency management, and advanced vehicle control.

Strategies for near-term and long-range deployment of ITS elements in the Metropolitan Boston Region were developed and presented as part of an early deployment study completed in January 1993. Similar planning activities are beginning which will lead toward the development of a statewide ITS strategic deployment plan. Further ITS strategic planning activities include active participation in the I-95 Corridor Coalition and ITS America.

Meanwhile the state transportation agencies continue to move toward the integration of these advanced technologies throughout the transportation system. Examples of this integration of technology with transportation management systems include planning and design of surveillance, detector, monitoring, control and emergency systems for the Central Artery/Third Harbor Tunnel; the continued testing of advanced traveler information systems to provide real-time information for pre-trip and enroute user services; multi-agency cooperation for the development of electronic toll collection and toll management systems; and deployment of dedicated fiber-optic communications networks throughout the state.

South Boston Piers Transitway

The South Boston Piers Transitway involves the construction of a new transit line between South Station Transportation Center and the South Boston Piers area near the World Trade Center. The service would consist of electric dual mode buses operating in a dedicated tunnel under the Fort Point Channel. The tunnel will have three stations: South Station, Fan Pier/Pier 4, and the World Trade Center. Beyond the World Trade Center, transitway vehicles will operate on city streets in the same manner as diesel buses. Construction of the tunnel will be coordinated with the Central Artery/Third Harbor Tunnel project.

High Occupancy Vehicle Lanes

High Occupancy Vehicle (HOV) lanes are planned for most of the radial highways in the Boston metropolitan area. Using movable barrier technology, a contraflow HOV lane will be added to the Southeast Expressway on an interim basis. Eventually the movable barriers will be replaced by a dedicated reversible flow HOV lane. The recent extension of the I-93 HOV lane north of the Central Artery is planned for further extension. HOV lanes are also planned for Route 24 and I-95 in the future.

Route 128 Project

Prudent investments in highway projects that increase capacity are warranted when other alternatives are unable to solve congestion and air quality problems. Alternatives are being studied for ways to add a lane to Route 128 in each direction. It is yet to be decided whether the new lanes will be HOV or general purpose.

Circumferential Transit

Three new cross town bus routes have been established as part of the Urban Ring. These routes are designed to meet the needs of both employers and employees by linking the radial transit lines and providing improved service to employment and shopping centers outside the downtown. To address longer term needs, light rail alternatives will be studied. The PMT suggests that there is significant demand for improved circumferential transit services, but that costs would be high.

Blue Line-Red Line Connector

The Blue Line and the Red Line would be connected via a subway under Cambridge Street. This would link the Bowdoin Square Blue Line station with the Charles Station of the Red Line and would provide better distribution for trips starting on both lines, including travel to Logan Airport.

High Speed Rail and Commuter Rail Extensions

Amtrak's plans for full electrification of the Northeast Corridor will reduce rail travel time to New York City to three hours. Amtrak is also making plans to extend rail service to Portland Maine, completing the Northeast Corridor. Fast and affordable train service may preclude the need for major new airport facilities in Massachusetts.

The Old Colony Commuter Rail Restoration project will provide South Shore commuters with an additional alternative to the Southeast Expressway. The Middleborough, Plymouth, and Greenbush Lines will restore service to 23 cities and towns. Congestion on the Expressway plus crowding on Red Line trains and in station parking lots emphasizes the need for this project. The Old Colony project is the largest mass transportation project in the Region. In addition to the Old Colony Commuter Rail Restoration project, commuter rail has been extended to Worcester and will be extended to Newburyport. Bringing commuter rail service to Fall River and New Bedford is also under study.

Implementation of the Americans with Disabilities Act

The MBTA is launching a major effort to help senior citizens and customers with disabilities access MBTA services. Among the improvements to existing facilities are: tactile strips on the edge of train platforms, curb cuts, sign upgrades, telephones with volume controls and elevator modifications. More lift-equipped buses will be delivered in early 1995 making more than two-thirds of the bus fleet wheelchair accessible. To make the Green Line more accessible the MBTA is acquiring 100 "low floor" cars. Combined with upgrading stations, the Green Line will become accessible to the disabled. As part of the Blue Line modernization, the entire line will be made barrier-free.

Water Transportation

Water transportation is an under utilized travel mode. To better develop this travel option new commuter boat terminals are under study for both Quincy and Hingham. Two commuter boat terminals are also planned for the North Shore with access to I-95.

New Interchange Projects

A new interchange on I-495 at the Marlborough / Southborough border will relieve traffic congestion. Another interchange project with major regional implications will provide more direct access from I-93 to

the Woburn industrial area. This project will reduce congestion on local roads as well as the nearby I-93/I-95 interchange.

CAPE COD COMMISSION (CCC) REGIONAL TRANSPORTATION PLAN SUMMARY

The Long Range Transportation Plan for Cape Cod was developed in coordination with local and state efforts. The planning process began with an assessment of existing infrastructure, usage, and system performance measures. This process led to an identification of present and future transportation needs. An extensive public participation process was developed and implemented to gather input during the development of the plan. Factors considered during the process include land use, historic preservation, environmental issues, economic issues, and financial constraints.

Transportation is one of the most difficult issues facing Cape Cod. Residents and visitors are heavily dependent on private automobiles as the only reliable means of mobility; public transportation options are limited. As a result, traffic congestion is an increasing problem: the road system which is generally adequate to serve the Cape's year-round population becomes seriously overloaded with the influx of summer residents and visitors. Traffic congestion causes driver frustration, worsens air quality, increases accidents, and wastes valuable time and fuel. Traffic congestion is probably the most visible negative consequence of an imbalance between land use and infrastructure.

REGIONAL PROFILE

Geographically, Cape Cod is a narrow peninsula that extends like a bent arm with a clenched fist into the Atlantic Ocean. The 364-square mile area is approximately 65 miles long - with a width ranging from about three miles in Truro to about ten miles in Falmouth. Most of the Cape is separated from the mainland by the Cape Cod Canal which bisects the Town of Bourne.

Cape Cod consists of 15 diverse communities that have a total year round population of 180,000 people. The 1990 U.S. Census resulted in the designation of the Barnstable-Yarmouth Metropolitan Statistical Area (MSA), with a population of nearly 135,000. These statistics, however, do not provide a true picture. On a given summer day, the number of people on Cape Cod exceeds 500,000. While every town experiences an increase in summer population, the smaller communities, such as those in the Outer Cape, experience the largest percentage increases in population.

The economy is composed of several main elements. The largest components of the Cape's economy are based on tourism, seasonal businesses, and retirees. A recent analysis of the Cape's economic base identified the following key segments:

- Tourists and seasonal businesses. 44%
- Retirees 15%
- Business services 11%
- Commuters 7%
- Manufacturing 6%
- Marine 5%
- Defense 5%
- Other 7%

REGIONAL GOALS

Among the regional goals for Cape Cod are the following:

- To encourage sustainable growth and development consistent with the carrying capacity of Cape Cod's natural environment in order to maintain the Cape's economic health and quality of life and to encourage the preservation and creation of village centers and downtown areas that provide a pleasant environment for living, working, and shopping for residents and visitors.
- To foster a transportation system on Cape Cod for present and future year-round needs which is safe, convenient, accessible, economical, and consistent with the Cape's historic, scenic, and natural resources.
- To develop alternate modes of transportation so as to reduce dependence on automobiles.

EXISTING CONDITIONS

Two bridges, the Sagamore and the Bourne, provide the only automobile connection to and from the "mainland". A third "vertical lift" bridge provides a railroad connection to the mainland, with rail lines extending to Dennis and Falmouth. In addition, Cape Cod has two airports with scheduled air service. There is year-round ferry service between Cape Cod and the islands of Martha's Vineyard and Nantucket and seasonal ferry service from Boston to Provincetown.

The main elements of the roadway system are Route 6, Route 6A, Route 28, Route 132, and a network of town roads. Traffic volumes on many of Cape Cod's roads have doubled since the mid-1970s. In some locations, such as at the canal bridges, the summer peak volumes of the 1970s are the average year-round volumes of the 1990s. Out of 339 miles of major roads analyzed for the Long Range Transportation Plan, 78 miles are considered to be operating at or near capacity during peak times.

Much of the Cape's "non-automobile" service is provided on a limited, seasonal basis. For example, rail service to and from Cape Cod is summer weekend service only. Commuter bus service is provided to and from Boston and some fixed route service is available on Cape Cod on a year-round basis. In addition, local summer shuttle services operate in several Cape Cod communities.

Cape Cod also has a network of bicycle paths and routes. The longest path is the Cape Cod Rail Trail which is approximately 30 miles long and extends from Dennis to Wellfleet. These paths are a viable alternative to automobile travel during the summer, providing access to villages, beaches, ferries, and numerous other destinations.

Still, based on census data, over 85% of Cape Codders commute to work via single-occupant automobiles, well above national averages.

FUTURE CONDITIONS AND PROBLEM IDENTIFICATION

Unfortunately, if current trends continue, traffic conditions will worsen substantially. The acreage of developed residential land doubled between 1971 and 1990. Even so, approximately one-half of the potentially buildable land remained undeveloped as of 1990. Development over the next 30 years could

increase traffic congestion considerably. Based on a projected 17% increase in housing units, the miles of congested roads would reach 199 out of 339 miles analyzed. Clearly, critical elements of the road system on Cape Cod are approaching gridlock.

ENVIRONMENTAL AND OTHER ISSUES

The options to deal with these projections are limited. Cape Cod has a unique, fragile environment. There is limited land available to build additional road capacity. The Cape's sole source aquifer limits the desirability of solutions that will increase storm water runoff. In addition, historic qualities and area character may be seriously jeopardized by building new and wider roads.

Some of the worst air quality readings in Massachusetts have been recorded on Cape Cod. Therefore, roadway improvements that would encourage more vehicle miles travelled (VMTs) and increase automobile emissions may not be acceptable.

RECOMMENDATIONS: PROGRAMS AND PROJECTS

The future of Cape Cod's transportation system is rooted in a number of opportunities and constraints. The new regional perspective offered by the Cape Cod Commission Act and the ISTEA provide an opportunity to improve Cape Cod's transportation system. However, financing, land availability, and virtually unmitigatable impacts to water resources and scenic character seriously limit the feasibility of road improvements. The traditional solution of providing an ever-increasing supply of roadway lane mileage is no longer viable. There is a need to explore neglected and new modes and means of moving people including a system of bus, rail, air, and waterborne service to and from the Cape, integrated with an on-Cape system of automobile, bicycle, pedestrian, and public transportation facilities.

The Commission is in an ideal position to shape new transportation initiatives to meet the demand for alternate modes of travel. The issues of automobile traffic demand and roadway capacity supply must be addressed so as to

- shorten distances between trip origins and destinations by promoting a village-centered settlement pattern;
- promote safe access to roadways through controlled spacing of curb cuts;
- promote development patterns which permit traffic improvement measures only where they can be provided without detracting from environmental and scenic resources; and
- promote alternatives to conventional automobile travel such as public transportation, bicycling and walking, and public/private associations dedicated to implementing commuting and recreational travel alternatives, also considering the needs of the disabled.

The natural beauty, historic character, and rural charm of the Cape should not be compromised merely to accommodate more automobile traffic. The mobility that the people of the Cape need and deserve should be consistent with the Cape's historic, scenic, and natural resources.

Key projects and programs to be developed include a variety of automobile and non-automobile improvements including

- maintenance of the existing transportation infrastructure;
- multimodal transportation center and improved intermodal connections;
- improved seasonal and year-round bus service;
- additional park-and-ride lots;
- enhanced air service;
- improved passenger rail service;
- expansion of the Cape's bicycle path network and related amenities:
 - Harwich/Chatham spur off the Cape Cod Rail Trail
 - Route 6 crossings in Harwich & Orleans
 - Wellfleet extension of the Cape Cod Rail Trail
 - Dennis/Yarmouth/Barnstable extension
 - Shining Sea Path extension in Falmouth
- improved use of water for transportation;
- travel demand management/systems management strategies;
- improved pedestrian amenities;
- key intersection and roadway improvement projects;
- major road projects, including reconstruction of the Sagamore Rotary, improved access to Hyannis and improved access to the mainland;
- Hyannis Intermodal Transportation Center;
- improved Canal area transportation; and
- implement a Cape-wide Intelligent Transportation System.

In conclusion, there is a need to promote alternatives to the automobile while recognizing its continued role. The Long Range Transportation Plan for Cape Cod accomplishes this balance by advocating continued improvements to the road system while developing badly needed alternative modes of transportation.

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CENTRAL MASSACHUSETTS REGIONAL PLANNING COMMISSION (CMRPC) REGIONAL TRANSPORTATION PLAN SUMMARY

The introductory section of CMRPC's 1993 Regional Transportation Plan, or "T-Plan", includes an executive summary of the T-Plan development process followed by a discussion of its purpose, briefly explaining the requirements and implications of both the ISTEA and CAAA legislation. As part of this explanation, the "15 ISTEA Factors" to be considered within the scope of the T-Plan are specifically listed. Additionally, this section also details the extensive public participation effort utilized throughout the development of the T-Plan.

REGIONAL PROFILE

Within the "Regional Characteristics" section of the T-Plan, a discussion of the area's key socio-economic statistics is presented, including: population, housing, and employment. Past trends as well as future year growth projections, based on likely increases in area housing and employment, are summarized. CMRPC's new regional planning initiative, the "Development Framework", designed to help individual communities make sound land use planning decisions in order to coordinate growth on a regional level, is discussed. Also presented are the results of an areawide travel survey of the CMRPC Region. The survey provided the basis for deriving regional trip rates and other travel characteristics.

REGIONAL GOALS

The general goals of CMRPC's transportation planning process, as listed in the '93 T-Plan, are as follows:

- encourage an efficient, economical and safe transportation system;
- encourage a transportation system that is compatible with the human and natural environment;
- encourage a coordinated transportation system; and
- establish a transportation system which provides alternatives to the traveler and to the shipper of goods for whatever origin, destination, mode of movement, or purpose a trip may have.

EXISTING CONDITIONS

The '93 T-Plan individually addresses each of the region's major modes of transportation, including highway, public transportation, airports, freight railroads, and regional bikeways, trails, and pedestrian facilities. Each section is organized in a similar format. After presenting an existing conditions inventory, any current issues impacting the particular mode are identified. Recommendations aimed at optimizing both the present and future operations of the mode, which in many cases cite specific improvements, are summarized. Additionally, the interactions between the region's various modes, where applicable, are also discussed.

The highway section of the T-Plan includes an inventory of the highway facilities serving the Region as well as a summary of the traffic volumes recorded on these roadways. Listings of congested highways, high accident intersections, and deficient bridge structures are also included. Area trucking activities were inventoried in cooperation with the American Trucking Associations (ATA) Foundation, which voluntarily

conducted a survey of the trucking companies operating within the Region. Area van pool activity is discussed. Regional pavement management efforts are also included.

The public transportation section focuses mainly on the operations of the Worcester Regional Transit Authority's (WRTA) fixed route and paratransit services, while also including discussions pertaining to both intercity bus and passenger rail. Within this section, the Americans with Disabilities Act (ADA) of 1990 is discussed in detail as part of the section on area paratransit services.

Within the T-Plan's airport section, the operations of the region's commercial and general aviation facilities are examined, with an emphasis on Worcester Municipal Airport. The freight rail section focuses not only on the five freight railroads operating within the Region but also on area intermodal activities between the region's rail and trucking industries. Current issues affecting the area's freight railroads include the designation of the National Highway System, the impacts of the Cohen Bill, and the Route 146 project. CMRPC's T-Plan also includes a section devoted to the region's existing bikeways, trails, and pedestrian facilities. The conversion of abandoned railroad right-of-way to bikeways received particular attention while the city of Worcester's ongoing Main Street beautification project is also discussed. The financial plan component of the document (while recognized as a first-cut attempt) demonstrates that the funding necessary to implement the transportation improvements in the '93 T-Plan will be available over the 30 year forecast period.

FUTURE CONDITIONS AND PROBLEM IDENTIFICATION

A major component of the T-Plan's highway section focuses on the development and calibration of a regional traffic simulation model using the Quick Response System II software. Housing and employment projections for the benchmark years 1996 and 2020 were used to forecast future year traffic volumes, enabling the identification of roadways where congestion is projected to occur. A number of recommendations are listed which suggest that particular intersections or roadway corridors be studied more thoroughly. Additionally, several potential roadway improvement options have been examined using the model in order to determine, at a regional level, how some options might impact area traffic flows.

The overriding issue facing the region's public transit providers is how to maintain existing levels of service under the limited financial resources that are available. In the airport section, ongoing improvements at the region's airports are discussed while planned future improvements are also summarized. Regionwide rail issues addressed are the future of the recently established intermodal terminal at Fort Devens, double-stack bridge clearances, and right-of-way banking. Several major ongoing projects and proposals, including the Massachusetts Blackstone River Bikeway, the Southern New England Trunkline Trail and the Quinebaug River Rail-Trail are detailed within the Plan's bikeway section.

ENVIRONMENTAL AND OTHER ISSUES

Other transportation issues affecting CMRPC's Region, notably air quality, have also been addressed as part of the T-Plan. The air quality section discusses the strategies that will potentially be funded under ISTEA in order to meet the attainment requirements of the CAAA. The requirements of the CAAA and ISTEA as they apply to the Region, as well as the guidance received to date from the Massachusetts Department of Environmental Protection, the Massachusetts Highway Department and the Environmental

Protection Agency are presented. A number of workable strategies and programs that could potentially play a role in the reduction of the amount of harmful pollutants within the Region are identified, including state-wide measures, new technological improvements, a congestion management system, and potential transportation control measures.

RECOMMENDATIONS: PROGRAMS AND PROJECTS

CMRPC's 1993 Regional Transportation Plan is the first area wide T-Plan prepared since 1982. Therefore, the '93 Plan was the first attempt to meet the Plan requirements of ISTEA. The two "non-exempt", major projects identified in the '93 Plan are the Route 146 and the Intermodal Transportation Center projects.

The Route 146 / Route 20 / Massachusetts Turnpike interchange will enhance mobility in central Massachusetts. This project will dramatically improve access to the City of Worcester and surrounding communities. Route 146 is the principal north-south arterial of the Blackstone Valley and the new interchange will open up this entire region for economic development. Commuter rail service has been extended to Worcester from Boston facilitating train service to and from the restored Worcester Intermodal Transportation Center.

As the Region has been designated a Transportation Management Area, CMRPC is planning to produce the next full update of the T-Plan in 1996. In the interim, air quality conformity determinations are expected to be based on the projects included within the '93 Plan. Ongoing work activities will contribute substantially to the 1996 update including the various modal components. Examples are the expected outputs from soon to be implemented management systems activities, the currently ongoing CMRPC land use planning initiative, and the "Development Framework", which is expected to provide refined inputs to the regional traffic simulation model.

FRANKLIN COUNTY PLANNING DEPARTMENT (FCPD) REGIONAL TRANSPORTATION PLAN SUMMARY

The Franklin County Commission drafted and endorsed a Long Range Regional Transportation Plan in 1993 in accordance with the provisions of the ISTEA. The Plan was updated in July of 1994. This summary will highlight some of the major components of the Plan. The complete document is available and may be obtained by contacting the Franklin County Commission.

REGIONAL PROFILE

Franklin County is the northern-most Massachusetts county in the Connecticut River Valley. It borders Vermont and New Hampshire on the north, Berkshire County on the west, Hampshire County on the south and Worcester County on the east. Franklin County's land mass is 725 square miles. The soils within the Connecticut River Valley are ideal for agriculture, and the County has a rich agricultural history. More than 56,000 acres of land in 1985 were used for agricultural purposes. Much of Franklin County is still rural with 78% of the County forested by 1985. In fact, Franklin County is the most rural county in Massachusetts. The population density in Franklin County in 1990 was 99.8 people per square mile, the least dense county in the state. The county has two population and employment centers: Greenfield/Montague and the Orange area. Thirty-eight percent of the 1990 population lived in Greenfield and Montague, and another 10% lived in Orange, which further indicates the rural character of the County's surrounding towns.

The total population in Franklin County in 1990 was 70,092. This represents an 18% increase in growth from 1970, which is significantly higher than the State's overall growth rate of 6%. However, Franklin County has not had an increase in employment opportunities to coincide with the population increase. This imbalance has resulted in Franklin County serving as a bedroom community for the more urbanized regions to our south.

The high growth rate in Franklin County can primarily be attributed to the quality of life which the county offers. Forests and farms predominate the landscape. Undeveloped land and the scenic beauty of horses grazing and acres of cornfields attract people seeking a more peaceful way of life. Relatively affordable housing with land for a lawn or garden make the area even more idyllic. Access to employment opportunities both within and outside of the county make it a realistic location to settle. A further contributor to the attraction of Franklin County is an uncongested road network that justifies a longer commute.

It is expected that Franklin County will continue to grow over the next twenty years. The projected population of the county in the year 2000 is 74,849, a 6.8% increase from 1990. Based on population trends, economic centers, and conditions within and outside Franklin County, the population in the County in 2020 is projected to be no greater than 83,000. This represents a 17% increase from 1990. These projections are based on the following assumptions: the proposed high speed rail line from Springfield to Boston will not be operational by 2020 and there will be no significant increase in the size of the nearby colleges and universities located in Hampshire County (University of Massachusetts, Amherst College, Hampshire College, Mount Holyoke College, and Smith College). If either of these factors change, Franklin County could experience unprecedented population growth.

REGIONAL GOALS

The goals and objectives of the Regional Transportation Plan are designed to provide an overall direction and focus for planning over the next 25 years. As such, they are general in nature and are listed below. (specific goals and projects are included under the Projects and Programs).

- Enhance mobility of Franklin County residents by ensuring that residents are able to travel freely and efficiently with transportation alternatives.
- Enhance mobility of goods going through, to, and from Franklin County by ensuring that goods and freight can travel through and within the County efficiently and that intermodal connections are available.
- Improve air quality and conserve energy by reducing automobile use and emissions.
- Eliminate and/or mitigate environmental degradation resulting from construction, repair, maintenance, or use of transportation facilities by ensuring that water quality and soil stability and integrity are not compromised by transportation facilities.
- Improve safety by ensuring that County roadways and transportation alternatives are safe.
- Enhance economic development by creating a safe, efficient, and comprehensive intermodal transportation network.
- Encourage sensible land use by recognizing the link between an efficient intermodal transportation network and balanced land development.
- Maintain rural character by ensuring that transportation improvements are designed and constructed in ways that enhance mobility while respecting and maintaining the historic and rural character of roadways, bridges, and communities.
- Provide public access to natural resources by ensuring that the general public may gain access to public water bodies and other natural areas.

EXISTING CONDITIONS

Franklin County has approximately 1,702 miles of roadway of which only 128 miles are classified as urban. The road network is relatively uncongested and there are very few roadways that operate at capacity. The annual County growth rate of average daily traffic (ADT) on the Massachusetts Highway Department (MHD) monitored routes, has been calculated at 2.9%. Similarly, daily vehicle miles travelled (DVMT) are expected to increase at an annual rate of 2.7%. Despite the overall increases in ADT, traffic still flows freely on most roadways in the County. Two trouble spots are Route 2 from Orange to Millers Falls and Routes 5/10 in Deerfield. Route 2 between Orange and Erving is a two-lane highway that also acts as the main street of Erving and the access and feeder road to the Erving Paper Mill. Upgrading this route has been studied at length and several alternatives have been proposed to resolve the traffic and safety issues along this stretch. At this time, consensus has not been reached on the pursuit of any one of the alternatives. Route 5/10 in Deerfield provides access to I-91 at two locations. Yankee Candle, a major employer and tourist attraction, is also located on this stretch of road. MHD is in the process of widening and upgrading this roadway by providing dedicated turning lanes and signalization at three of the major intersections.

FUTURE CONDITIONS AND PROBLEM IDENTIFICATION

A continuing and primary focus of transportation planning within the County will be to identify roads, highways, and bridges that are nearing capacity, are congested, unsafe, or are in need of some other kind of improvement. Encouraging alternative modes and expanding the existing fixed-route system will also be of paramount importance. A combination of travel demand modelling, pavement management, and the expertise of County highway superintendents, transit operators, and engineers will be used to identify future needs for highway, transit, and bridge projects. As projects become priorities, they will be added to the Transportation Improvement Program (TIP). Because there are few capacity problems, Franklin County is in the fortunate position of choosing projects that will improve and enhance its current transportation network, rather than resolving problems which currently exist. Projects which will need to be addressed include: Route 2; Route 8A between Plainfield and the Vermont State Line; fixed-route service between the Athol/Orange area and Greenfield; the Franklin County Bikeway; and a number of road projects in Greenfield, Montague and Orange.

ENVIRONMENTAL AND OTHER ISSUES

One of the primary transportation-related environmental issues in Massachusetts is air quality. In a rural region like Franklin County, residents are generally unaware that there is an air quality problem. Our challenge will be to develop effective methods for reducing automobile use and to educate people about the air quality problem in the County. Specific projects which will be targeted to address air quality include: bicycle facilities; bike racks on buses; expanded transit service; alternative fuel buses; carpool matching; ride-share program; and expansion of passenger and freight rail service within the County.

RECOMMENDATIONS: PROGRAMS AND PROJECTS

The Franklin County TIP outlines the transportation projects which are expected to be initiated over the next three years. Central to the ISTEA tenet of public involvement, it is the TIP that assures that regionally identified transportation improvement projects are prioritized over the next three years. Major long range projects expected beyond the three year scope of the TIP include the following:

Route 2. The problems on Route 2 from the Athol/Orange town line west to Greenfield will need to be resolved before 2020. Route 2 is the principal east-west highway across the northern section of Massachusetts. This section of Route 2 is narrow and winding. There are 13 speed limit changes between Greenfield and Philipston plus unlimited highway access to homes and businesses. The Erving Paper Company, a major manufacturer and employer, is also located on Route 2 in this area, generating morning and evening commuter traffic and truck traffic throughout the day.

Several alternatives have been put forth to expand capacity, improve safety and realign the roadway. All alternatives require the taking of some land; some options require the taking of State forest land. Alternatives range from widening the existing road and making no changes to the residential and commercial access, to realigning Route 2, creating a limited access highway. A feasibility study will be undertaken to fully evaluate this important corridor.

Route 8A. Approximately 20 miles of Route 8A that traverse the towns of Plainfield, Hawley, Charlemont and Heath need to be reconstructed. Route 8A is not only very narrow but has numerous drainage and

structural problems. However, area residents are worried that improvements to the highway may diminish the rural character of their towns.

Fixed-Route transit service to the Athol/Orange area. The towns of Athol and Orange are located thirty miles east of Greenfield. The combined population of the two towns is 18,800, approximately equal to that of Greenfield. At present, there are no public transportation options available to the citizens of the Athol/Orange area, with the exception of demand-response service which is only available to the elderly and/or handicapped. The lack of public transportation in this area results in the total reliance on the private automobile. The 1990 census shows journey-to-work trips between Greenfield, Athol, and Orange totalled more than 1,300 per day.

MARTHA'S VINEYARD COMMISSION (MVC) REGIONAL TRANSPORTATION PLAN SUMMARY

Martha's Vineyard is the largest of a group of islands lying off the southern coast of Massachusetts. Covering nearly 55,000 acres, Martha's Vineyard possesses a diverse landscape fringed by barrier beaches and fragile wetlands.

Open space is a fundamental aspect of the Island's character. Forests, farms, and market gardens that surround villages define rural settings. Sheltered harbors, bays, and ponds support fisheries and wildlife habitats. Coastal scenic and recreation areas attract visitors to the Island.

Farming and fishing, the Island's first industries, gave way to whaling which dominated the local economy especially during the 30 years leading up to the Civil War. In 1866, when speculators began subdividing and selling lots in Oak Bluffs, Martha's Vineyard became a summer resort. Tourism is now the Island's economic mainstay.

The economy of Martha's Vineyard (as well as on neighboring Cape Cod and Nantucket) is dependent on income brought to the Island by tourists, seasonal visitors, retirees, and second-home owners. Despite the vagaries of weather conditions, vacation trends, and the state of the nation's economy, Martha's Vineyard has been able to grow and thrive. Future growth, though, if not wisely guided, may jeopardize the Island's attractiveness and the quality of its environment.

Year after year, millions of passengers are carried to and from the Island via ferries and airplanes. The Woods Hole, Martha's Vineyard and Nantucket Steamship Authority, which is the Island's "lifeline", provides efficient and effective intermodal regional connections. Increasingly, feeder bus services are extending the mobility of Islanders. Such coordinated services demonstrate the importance of intermodal transportation planning and its role as a bridge between economic and environmental planning.

REGIONAL PROFILE

The year-round population of Martha's Vineyard grew 30% during the 1980s. While 11,600 persons reside on the Island during the winter, more than 70,000 persons live on Martha's Vineyard during the summer. Migration rather than natural increase explains the recent population gains. The most significant increase in population has been among young adults between the ages of 20 and 25, and among the elderly who have chosen to retire to Martha's Vineyard. The Island's population is forecast to grow 20% during the 1990s.

One of the effects of population growth and Martha's Vineyard's popularity as a destination resort is the demand for housing. In 1990, there were 11,600 dwelling units, 40% of which were built between 1976 and 1990. Only 5,000, however, were occupied. Nearly all of the unoccupied dwellings were for seasonal use.

New housing construction activity has tended to occur in those towns - Edgartown and West Tisbury - where population growth during the 1990s was greatest. In relation to the state as a whole and to rural areas, Martha's Vineyard has a relatively low percentage of year-round housing units dedicated to rental housing, very high median gross rents, and an extraordinarily high percentage of renters who have moved in the past year.

To a large extent, the economy of Martha's Vineyard centers on serving the needs of seasonal residents and tourists. Relative to the more rural areas of the state, Martha's Vineyard has a relatively high concentration of service and retail workers, relatively low annual wages for local jobs, and relatively high unemployment during the winter. Most businesses are small (employing fewer than five employees) and dispersed throughout the Island.

Although the county's per capita income, \$18,280, exceeds state wide norms, the high cost of living on Martha's Vineyard erodes the purchasing power of family incomes.

REGIONAL GOALS

Three dominant themes echo throughout the Regional Transportation Plan for Martha's Vineyard:

1. The regional transportation system must enhance the mobility of Islanders and accommodate seasonal travel patterns.
2. Transportation projects to be chosen by Islanders will be, first and foremost, choices concerning environmental quality and economic development.
3. The Island's transportation system is indeed an intermodal system.

EXISTING CONDITIONS

The regional goals emerged from a review of development trends. The Island's rapid development in the 1980s was perceived by many year-round and seasonal residents as a very serious problem threatening fragile natural resources and straining municipal services. Along with the other planning issues, the following key transportation issues were defined:

- congestion is an increasing problem in the Edgartown, Oak Bluffs, and Tisbury business districts;
- different modes of travel must be accommodated within the existing road network;
- new development must be coordinated with the capacity of the road system and should be located to minimize traffic and parking problems; and
- a convenient and efficient transit system is needed.

FUTURE CONDITIONS AND PROBLEM IDENTIFICATION

The development of Martha's Vineyard depends on mobility and access. Yet, enhanced access must not compromise the Island's fragility - vulnerable ground and surface waters, woodlands and wetlands which provide wildlife habitats, and an irreplaceable rural character. Regional transportation system improvements are essential elements in the Island's growth management strategy.

Regional transportation needs straddle conflicting viewpoints. For example, traffic flows evenly and safely on many of the Island's roads. But, seasonal traffic flows burden major roads and disrupt the Island's quality of life. Determining the proper mix and timing of regional transportation improvement projects is an ongoing process directed by the Martha's Vineyard Joint Transportation Committee (JTC).

The JTC has formulated a TIP for the Martha's Vineyard Region. Overall, the TIP outlines projects related to the Island's growth management strategy, promoting the efficient use of the existing regional transportation system and reducing the number of vehicle trips in order to manage seasonal traffic congestion.

Congestion management is one of several management systems cited in the ISTEA. The Regional Transportation Plan for Martha's Vineyard lists 48 interim proposals that should be followed in order to manage various management systems, such as: roads and bridges, road safety, public transportation facilities, as well as intermodal transportation facilities.

RECOMMENDATIONS: PROJECTS AND PROGRAMS

The following projects and programs are recommended in the Regional Transportation Plan for Martha's Vineyard:

- construction/completion of intermodal terminals at:
 - Martha's Vineyard Airport
 - Oak Bluffs Harbor
 - Vineyard Haven
 - Cuttyhunk Island
- restoration of the "Nobska" ferry boat and service;
- construction/completion/enhancement of the Island bicycle path and trails network;
- acquisition of public transportation vehicles;
- enhancement of public transportation system (shelters, signage, park-and-ride facilities, and landscaping);
- continuing financial assistance to operate the public transportation system;
- road improvements designed to improve water quality; and
- maintain and improve Edgartown/Vineyard Haven Road and other main roads.
- bridge replacement and rehabilitation.

MERRIMACK VALLEY PLANNING COMMISSION (MVPC) REGIONAL TRANSPORTATION PLAN SUMMARY

The 1993 Merrimack Valley Regional Transportation Plan (RTP) identifies the transportation needs of the Region and outlines projects, programs, and proposals to meet these needs. The RTP is designed to identify the long-term problems that will confront the region's transportation system. It includes the land use, socioeconomic, environmental, and other considerations that largely shape transportation demand and the transportation network. The RTP also recommends either possible solutions to the identified problems/needs or a definition of what types of further analysis must be undertaken to determine the most appropriate solution. The RTP is one of the requirements of ISTEA.

Much of the work involved in developing the Regional Transportation Plan centered on gathering information on existing transportation conditions. This involved compiling regional data on employment, population, income, households, and many other socioeconomic factors, as they directly influence the demand for transportation services in the Valley. MVPC staff also gathered data on the region's airport, transit, railroad, port, and bikeway/pedestrian facilities. The condition of the existing highway system was evaluated, which included identifying structurally deficient bridges, hazardous intersections, and roadways overburdened by traffic.

A list of transportation goals and objectives were developed that reflected the problems found in the analysis of existing conditions. In order to meet these goals, a variety of alternatives were evaluated. Long range implications of transportation projects were addressed, including air quality conformity determinations and funding plans.

REGIONAL PROFILE

The Merrimack Valley Planning Region is located in the northeastern corner of the Commonwealth and is traversed by the Merrimack River, which has played a key role in the region's history and economy. MVPC's jurisdiction encompasses fifteen Essex County communities as follows:

- three central cities of *Haverhill, Lawrence, and Newburyport*;
- Four suburban communities whose centers developed around formerly active mills - *Amesbury, Andover, Methuen, and North Andover*; and
- eight rural towns located east and south of Haverhill - *Boxford, Georgetown, Groveland, Merrimac, Newbury, Rowley, Salisbury, and West Newbury*.

The Merrimack Valley has a long history as one of New England's earliest and most important industrial regions, as the Merrimack River provided early river transportation, commercial fishing and shell fishing, water-based recreation, and water power for mills. Overall, the Region has experienced the rise and fall of three different economic cycles: shoe manufacturing and textiles, defense related industries, and non-defense related high technology.

REGIONAL GOALS

The following transportation goals - consistent with the provisions of ISTEA - were outlined in the Regional Transportation Plan:

- Promote the interconnective use of all modes of transportation in the Valley.
- Develop programs and services which increase transit and paratransit usage.

- Maximize the efficiency and integrity of existing highway and transit systems.
- Improve the quality of the environment in the Merrimack Valley by promoting projects and programs that help the Region to meet all federal air and water quality standards.
- Eliminate safety problems that exist on the region's transportation system.
- Promote zoning and land use regulations which are consistent with the region's transportation goals.
- Undertake efforts to eliminate congestion on the region's transportation system.

EXISTING CONDITIONS

The region's 15 cities and towns are well served by an excellent highway network with over 1,400 miles of roadway. Interstate highways 93, 95 and 495 traverse the Region, providing vehicular access north, south, and west. Both I-93 and I-95 link the Region with Boston to the south. I-93 extends north to Manchester and Concord, New Hampshire. I-95 extends north to Portsmouth, New Hampshire and Portland, Maine. I-495 is a circumferential roadway that crosses every major highway in eastern Massachusetts. At least one of these three interstates passes through 14 of the region's 15 communities.

The Region receives a wide array of public transportation services from both public and private sources. These services include local and long distance bus routes, elderly and disabled services, taxi services, and commuter rail services that link the Region to Boston. The Merrimack Valley Regional Transit Authority (MVRTA) is the primary provider of public transportation in the Region.

Sixty bridges in the Region have been identified by the Massachusetts Highway Department as being structurally or functionally deficient. The MVPC Regionwide Systems Performance Study (RSPS) identified 37 intersections in the Valley as having potential safety problems. The RSPS also identified 39 roadway segments that are experiencing capacity or congestion problems. These roadways include I- 93 and I-495, the region's most heavily used roadways.

Many of the RTP's recommendations are geared toward solving these current problems, which follows ISTEAs emphasis on improvement and better utilization of existing transportation facilities.

FUTURE CONDITIONS AND PROBLEM IDENTIFICATION

A transportation model developed by the Central Transportation Planning Staff was used to project future traffic growth in the Region. This model identified 12 roadways with traffic growing by over 50% from 1990 to the year 2020. Emphasis will be given to identifying means of reducing demand on these roadways and improving their efficiency.

Requirements of the Americans with Disabilities Act (ADA) will severely limit the MVRTA's ability to initiate any new fixed route bus services in the foreseeable future. The Authority must devote substantial resources in providing complementary paratransit service for elderly and disabled individuals who are unable to use the existing accessible fixed route buses.

Increased diffusion of employment and residential growth in eastern New England make it increasingly difficult for traditional transit services to function effectively. Consequently, the RTP recommends that the

MVRTA investigate the feasibility of introducing generally available demand response services in less densely developed sections of its service area to supplement existing fixed route services.

ENVIRONMENTAL AND OTHER ISSUES

Air quality issues have become increasingly important due to recent legislation. CAAA mandate that the regional Transportation Plans and TIPs must contribute to reductions in annual mobile source emissions and must maintain consistency with the SIP for air quality. In an effort to meet these requirements, quantitative air quality analysis of projects is conducted by the MVPC where necessary and the results are included in the RTP. In addition, MVPC's regional traffic model has been used to obtain regionwide estimates of present and future vehicle emissions levels.

Water quality issues remain important as well. The untreated runoff from roadways poses a major threat to water quality. Runoff contains residue from tail pipe emissions, hydrocarbons from engine leaks and spills, as well as road surface materials such as asphalt. These pollutants can combine to produce high levels of certain toxic metals and nutrients. Current roadway construction practices emphasize the rapid removal of water from road surfaces for safety reasons. This process usually does not allow for pollutants to be naturally cleansed from the runoff stream. To the extent feasible, the RTP recommends that best practices for stormwater management be followed in the construction of transportation projects.

RECOMMENDATIONS: PROGRAMS AND PROJECTS

Many of the recommendations contained within the RTP consist of various transportation demand and control measures. These measures will be considered and studied on a regionwide scale to address the problems of congestion, safety, air quality, mobility, maintenance, and economic development. Some of these measures include

- programs for improved public transit;
- use of high-occupancy vehicle lanes;
- employer-sponsored programs to permit flexible work schedules;
- employer-based transportation management plans, including incentives;
- traffic flow improvement programs that achieve emission reductions;
- fringe and transportation corridor parking facilities for carpoolers and transit users;
- programs to limit or restrict vehicle use in downtown areas during periods of peak use;
- programs for the provision of all forms of high-occupancy shared-ride services;
- programs for secure bicycle storage facilities and other facilities, including bicycle lanes, for the convenience and protection of bicyclists, in both public and private areas;
- programs and ordinances to facilitate non-automobile travel, provision and utilization of mass transit, and to generally reduce the need for single-occupant vehicle travel;
- programs for new construction and major reconstruction of paths, tracks or areas solely for the use by pedestrian or other non-motorized means of transportation when economically feasible and in the public interest;
- parking pricing program involving either charging the solo driver more money for parking or discounting parking charges for carpoolers; and

- employer-sponsored telecommuting program to allow employees to work at home while linked to the work place through the use of a computer and modem.

Major Merrimack Valley transportation projects which are either planned or proposed include:

- rehabilitation of the Chain Bridge over the Merrimack River in Amesbury;
- Essex Street/Lupine Street improvements in Andover;
- Route 28 upgrade from Route 133 to I-495 in Andover;
- Georgetown Square reconstruction, Phase II;
- Groveland/Haverhill - Replacement of Bates Bridge;
- Comeau Bridge replacement in Haverhill;
- South Main Street reconstruction in Haverhill;
- upgrade Route 125 from I-495 to the New Hampshire border;
- widening of the I-495 bridge over the Merrimack River in Lawrence;
- widening of Route 114 from I-495 to the North Andover line;
- reconstruction of Route 28 from the Merrimack River to the Andover line;
- provide access to I-95 from Hale Street in Newburyport;
- improvements to Haverhill Railroad Square commuter rail station;
- replace 12 accessible MVRTA buses;
- purchase five intercity bus coaches for MVRTA commuter service; and
- re-institute Commuter Rail Service between Newburyport/Rowley and Boston.

The 1993 Merrimack Valley Regional Transportation Plan should not be thought of as a static document which will lock the Region into a specified course of action in meeting local and regional transportation needs. The MPO fully recognizes the fact that as the Region changes over time, so will its transportation demands and needs. In addition, projects which are planned today may reach roadblocks in the implementation stage that will affect the scheduling and funding for all projects. New data on the status and condition of the regional transportation network will become available on an ongoing basis. It is anticipated that the RTP will be significantly updated in the coming years.

MONTACHUSETT REGIONAL PLANNING COMMISSION (MRPC) REGIONAL TRANSPORTATION PLAN SUMMARY

The Montachusett Regional Planning Commission (MRPC) is comprised of 22 communities with approximately 675 square miles located in northern Worcester County and western Middlesex County. Fitchburg, Leominster, and Gardner, the major urbanized areas, comprise the largest communities in the Region.

REGIONAL PROFILE

The Montachusett Region consists largely of rural areas, with industrial centers located in the three cities of Fitchburg, Gardner, and Leominster as well as in the towns of Clinton, Ayer, and Athol.

The dominant employment centers in the Montachusett Region are Fitchburg and Leominster, comprising over one-third of the total employment in the area. Manufacturing remains the region's largest employer despite the almost 30% decline in jobs since 1970. Consistent with the rest of Massachusetts, service and wholesale/retail jobs are increasing. With this shift in employment has come an accompanying employment migration from the traditional urban areas of the Region to the less dense communities. Many of these new employment centers are less centralized, dispersing traffic to new areas and also creating problems for non-automobile transportation.

Within the Region, land use patterns, as expected, reflect the urban or rural characteristics of the communities. There is a greater percentage of acreage devoted to high-density residential, industrial, and commercial land uses in the urban areas. However, several rural member communities have enacted zoning changes to encourage commercial and industrial activities in their towns in an effort to increase their tax base and produce jobs and services. Although these communities desire greater economic activity, they still want to maintain the rural nature of their towns. Revitalization of the downtown areas of Fitchburg, Leominster, and Gardner is a major economic concern for the municipalities and the Region as a whole.

REGIONAL GOALS

- To provide a safe, reliable, multi-modal transportation system throughout the Montachusett Region for the movement of people and goods, to formulate strategies to attain and maintain National Ambient Air Quality Standards, and to seek appropriate funding mechanisms in order to implement policies and objectives.
- To improve the transportation system to accommodate passengers and goods between Boston, the Worcester metro area, and the three cities located in the Region. Special emphasis should be placed on multi-occupant vehicles and the public transit system.

EXISTING CONDITIONS

The Montachusett Region is served by several state numbered routes that provide accessible links to all of the region's communities. Maintenance, preservation, and improvements to the existing highway infrastructure are of considerable importance to the Region. It is anticipated that continued repaving and reconstruction work, as well as intersection and signal timing improvements will improve traffic flow throughout the Region.

Of great importance to the Region are its two major limited access highways. Route 2 is the main east-west state highway that runs from Boston to I-91 in Greenfield and eventually to New York, and is one of only two major east-west highways through the Commonwealth. Improved or alternative connections between Route 2 and the downtown Fitchburg and Leominster areas near Routes 12 and 13 are major regional considerations. Presently, Route 2 is only a four lane divided highway east of the Phillipston/Templeton town line. MRPC is interested in improving Route 2 as a four lane divided highway all the way from I-495 to I-91 in order to serve as a parallel east-west connector to I-90 (Massachusetts Turnpike). I-190 is the other major limited access highway. It runs north-south from Route 2 in Leominster to I-290 in Worcester and the Massachusetts Turnpike.

There are over 350 bridges in the Montachusett planning area. The efficient movement of goods and people are reliant upon the condition of these structures. The Massachusetts Highway Department (MHD) has identified 60 of these as structurally deficient. Some are in dire need of repair.

The trucking industries operating in the Montachusett Region have identified problem areas specific to their activity. They include bridge clearance or weight restrictions that force drivers to take inconvenient routes; unavoidable intersections which are difficult to negotiate, with detours taken due to difficult locations; and steep grades where the addition of a climbing lane would be helpful. The inadequate supply of truck loading space in downtown areas is also a major concern. Because there are very few alleys, most deliveries are made from the curb, regardless of whether legal parking is available.

Increasing concern for air quality and energy conservation is leading to renewed interest in the development of adequate facilities for bicycles throughout the Montachusett Region. There has been a noticeable increase in the number of bicycles around population centers and on the highways. This has resulted in obvious bicycle safety problems with increased bicycle-automobile accidents. Region-wide there is strong support for designated bikeways for recreation and commuting.

The cities of Fitchburg, Leominster, and Gardner have fixed route bus services administered by the Montachusett Regional Transit Authority (MART). Fitchburg and Leominster have three trunk lines between the two cities, six intracity routes in Fitchburg, and three intracity loops in Leominster. There are also two routes in Gardner running in opposite directions over the same loop circumscribing the city. Interstate bus service is limited to two companies providing minimal service to the Region. MART also manages numerous paratransit operations including a special needs program, medical assistance programs, an early intervention program, Council on Aging paratransit, and ADA complementary van services. MART also acts as a broker for home care, day care, and other human services agencies.

Commuter rail service in the Montachusett Region consists of approximately fifty-four round trips weekly on the Fitchburg line to North Station in Boston. MART and MBTA are combining their efforts to locate an intermodal facility in Fitchburg to serve regional commuters.

There are three railroad companies currently operating freight lines in the Montachusett Region. Guilford Transportation Industries is the largest operator of freight lines in the Region. It operates on a number of lines including those connecting the Moran Terminal in Charlestown to Mechanicville, New York. Consolidated Rail Corporation or Conrail operates one line running from Fitchburg to Clinton. The Providence and Worcester Railroad Company operates a line from Gardner to Hubbardston, eventually halting in South Worcester.

Within the Montachusett Region, there are four municipal airports. The Fitchburg Municipal Airport is by far the largest, with two fixed base operators located there. Although it is geographically close to Route 2, access to the airport can be confusing and is subject to traffic problems along Routes 12 and 13. The remaining airports, Gardner Airport, Sterling Airport, and Shirley Airport are general aviation airports for sport and/or recreation and not for the movement of goods or freight. Presently, the Moore Army Airfield at Fort Devens in Ayer is limited to support of military flights. With the closing of the Fort Devens base in 1995, this airfield has a questionable future. Access to the airfield is via Route 2A, with commuter rail currently stopping in Ayer approximately one mile away presenting a possible future intermodal connection.

FUTURE CONDITIONS AND PROBLEM IDENTIFICATION

Projections for region-wide highway transportation characteristics were examined and compared to base year values using the QRS II travel demand model. Forecasts for future years were influenced by the changes to demographic and economic parameters, as well as the anticipated land use changes due to the closing of the Fort Devens Military Base in 1995.

With the closure of the Fort Devens Military Base, it has been estimated that there are approximately 4,400 acres of land available for development. A probable scenario of five developments was created for analytical purposes. They include a multi-modal inland port-freight distribution center expansion, a U.S. federal prison hospital, a federally-funded Job Corps site, construction of an industrial/business/manufacturing complex, and the continued presence of the Army Reserve Enclave and the Army Corps of Engineers.

In addition, the following issues need to be addressed in the Region:

- Infrastructure maintenance, (i.e. bridges and roads) will continue to be a major concern of the Montachusett Region.
- Transportation improvements to both Routes 12 and 13 and their connections to Route 2 must be considered to relieve serious congestion problems along these routes.
- Support of the MART transit system will need to be continued in order to serve transit dependent persons. Improvement of the public transit connections between the Region and Boston and Worcester is also needed.
- The promotion of multi-occupant vehicles for commuting is needed.

ENVIRONMENTAL AND OTHER ISSUES

It is the intent of the Montachusett Regional Transportation Plan to promote the integration of transportation planning with environmental, land use, and energy conservation concerns.

The Montachusett Regional Transportation Plan is fully coordinated with the State Implementation Plan to ensure that the projects which proceed demonstrate air quality benefits.

Clean water in the Montachusett Region is one of its most valuable natural resources. To maintain pristine waters where they exist and improve conditions where they are substandard, pollution control through stormwater management should be implemented.

Protection and preservation issues such as avoidance, mitigation, and compensation for wetlands impacts must be included in the process of designing and maintaining transportation infrastructure. Along with these measures, the plan also seeks to identify enhancement programs that will contribute to a healthier, attractive environment.

MRPC has a broad objective to reduce energy consumption in the transportation sector. Decisions and recommendations which are channeled through the regional planning process can have a positive impact on energy conservation by reducing vehicle miles travelled. Transportation system efficiency in passenger and freight movement can also lead to energy savings.

RECOMMENDATIONS: PROGRAMS AND PROJECTS

- Seek funding for reconstruction and rehabilitation of existing highways and bridges as identified in the Short Range section of the Montachusett Regional Transportation Plan.
- The planned closure of Fort Devens in 1995 will significantly impact the Montachusett Region. The best reuse of Fort Devens area should be encouraged in order to lessen economic impacts and promote the Region. MART has recommended that the construction of a commuter rail station be studied as part of the intermodal transportation mix at the redeveloped base.
- Continued support for the MART transit system is needed. Operations should be expanded as necessary with consideration of special services to Boston and the Worcester metropolitan area.
- Develop the Fitchburg Commuter Rail Station into the Fitchburg Intermodal Center.
- Promote and support additional bicycling and walking trails to augment existing transportation facilities. These means of transportation are recognized as a viable alternative to transit and auto use.
- Purchase accessible buses for MART to comply with ADA requirements and replace vehicles that have out lived their usefulness.
- The following three roadway projects are recommended for further study:

Route 2: Improvement and upgrade of Route 2 from the Phillipston/Templeton Town Line to I-91 in Greenfield to a four lane divided highway. Presently, Route 2 goes from a four-lane divided highway to a two-lane undivided highway at this location.

Route 13 Connector: This potential project involves new connections between Routes 2 and 13 and Crawford Street and North Street in the City of Leominster and between North Street and Route 13 in the town of Lunenburg. This Connector proposal is recommended for further study and is not recommended for implementation at this time.

Fitchburg Connector: Construction of a long range alternative which would connect Crawford Street/Falulah Road with lower Main Street in the City of Fitchburg. The Fitchburg Connector would complement the improvements made as part of the Route 13 Connector project and would address the critical question of linking downtown Fitchburg with Route 2.

NANTUCKET PLANNING AND ECONOMIC DEVELOPMENT COMMISSION (NPEDC) REGIONAL TRANSPORTATION PLAN SUMMARY

Nantucket is an island of 49.53 square miles located 25 miles off the south shore of Cape Cod. Two sparsely populated barrier islands, Tuckernuck and Muskeget, lie to the west of the principal Nantucket island. Nantucket has unique geographic and natural characteristics, consisting of barrier beaches, and fragile inland and coastal wetlands. The Island is also home to a diverse mix of wildlife and plant habitats, some endangered.

In 1966, all of Nantucket was designated a National Historic Landmark, and in 1970 became a local Historic District. The Historic District Commission was created to oversee the district which contains over 400 historic dwellings, erected between 1750 and 1850.

Tourism is the base of Nantucket's economy. Protection of Nantucket's natural and historic resources are vital to maintaining the Island's attraction as a tourist destination and to its resource-dependent industries such as shellfishing.

Transportation management plays an essential role in Nantucket's future. The Island must maintain its historic character and still provide a safe and efficient means for visitors and residents to travel around the Island. Traffic gridlock now threatens the aesthetics and character of Nantucket's downtown which tourists and residents appreciate.

REGIONAL PROFILE

Nantucket has a year-round population of 6,012 residents (1990 U.S. Census). During the summer tourist season, from July 4th to Labor Day, the population can grow to 40,000 people (NP&EDC, Open Space and Recreation Plan, 1992).

A majority of the houses on Nantucket are second homes with only 20% occupied year-round (Town of Nantucket Assessor's Office). Between 1970 and 1990, the number of housing units on Nantucket increased by over 100%. There are 2,597 year-round households on Nantucket. Increasingly, residential construction has occurred in outlying areas necessitating greater use of vehicles to travel to centrally located commercial and institutional establishments.

Nantucket's tourist based economy generates an estimated \$40 to 45 million annually (Nantucket Chamber of Commerce). Retail and service workers comprise almost half of Nantucket's labor force. Construction, fishing, and shellfishing industries are also important to Nantucket's economy (Economic Base Analysis, 1993).

The median household and median per capita incomes for Nantucket County, although higher than those of the State, are offset by significantly higher cost of living on the Island (housing, food, off-island travel, gasoline, electricity, and home heating oil).

REGIONAL GOALS

In November, 1990, the **Goals and Objectives for Balanced Growth** were adopted by a vote of the Nantucket Town Meeting. The broad transportation goal is: *To provide a transportation system that will move people and goods to, from, and around the Island in a way that is safe, convenient, economical, and consistent with the Island's historic, scenic, and natural resources.* The plan recognized the many specific objectives of this effort which are identified in the proposed solution section.

EXISTING CONDITIONS

The Nantucket airport provides direct air links to Boston, metropolitan New York City (Newark, NJ), Hyannis, and Martha's Vineyard. Classified as a "principal arterial highway", the Steamship Authority operates the primary passenger and freight ferry service between Nantucket and Hyannis year-round. Privately owned, Hy-Line Cruises, also provides passenger service between Nantucket and Hyannis from May through October, and limited service between Nantucket and Martha's Vineyard.

Nantucket's 137.37 mile road network consists of: 23.36 miles of rural major collector, 15.02 miles of rural minor collector, and 98.99 miles of rural local roads. There are four major bike paths on the island totaling 17.5 miles: Milestone Road, Surfside Road, Madaket Road, and Cliff Road. The 8.2 mile Polpis Road Bikepath is currently progressing towards the commencement of construction in the spring of 1995. There is currently no public bus systems operating on Nantucket although private sightseeing and seasonal shuttle buses are operational. Within town, walking is an important and efficient mode of transportation.

Traffic congestion poses an immediate threat to Nantucket's historic core district. Often during the summer season, the downtown is gridlocked with vehicles, bicycles, mopeds, and pedestrians competing for a limited amount of space. Visitors must depend on private automobile, taxi cabs, or the limited private shuttles for vehicular transportation to outlying areas. Public transportation is non-existent, hindering mobility on the Island.

Many of Nantucket's streets were not laid out to accommodate heavy traffic and pose safety concerns for automobiles, bikes, pedestrians, and mopeds. Additionally, many of Nantucket's narrow brick sidewalks pose obstacles to accessible pedestrian routes such as uneven grade and lack of curb cuts.

FUTURE CONDITIONS AND PROBLEM IDENTIFICATION

Based on a detailed review of population and housing trends from the past twenty years, the Nantucket Planning & Economic Development Commission staff estimates that between 2700 (low growth) and 4100 (high growth) new homes could be built by the year 2010.

Currently, there are 1.56 vehicles per dwelling unit (1990 U.S. Census) and according to the slow growth scenario, 135 additional units per year would add an additional 211 vehicles per year, which equals an additional 4,212 vehicles by 2010. The scenario for more intensive growth would mean an additional 6,396 vehicles on the island, a 157.6% increase over a twenty-year period.

The Steamship Authority has projected increases in passenger, automobile, and truck traffic between 1992 and 2012. The projected increases are 54.98%, 15.68%, and 45.34% respectively. The passenger traffic increase translates into an additional 266,057 pedestrians coming to Nantucket annually.

ENVIRONMENTAL AND OTHER ISSUES

As outlined above, Nantucket has many unique and fragile land areas such as moors, heathland, dunes, barrier beaches, and geographical formations. The careful stewardship of these natural features are a priority when implementing transportation improvements. Because Nantucket is often subject to coastal flooding and shore erosion, transportation improvements must carefully address the impacts of flooding and/or potential soil erosion.

RECOMMENDATIONS: PROGRAMS AND PROJECTS

Nantucket's transportation objectives and policies are committed to encouraging non-motorized modes of transportation. The following solutions have attempted to consider alternatives with the least detrimental environmental impact.

Road Facilities:

- Intersection and road improvements to correct dangerous intersections, roadway widths, curbcuts, etc..
- Re-examine the existing traffic circulation pattern (one-way streets, etc.) to determine whether it is the most efficient and effective way to move traffic around and through the downtown.
- encourage a State legislative policy (i.e., Home Rule Petition) to allow Nantucket to enforce lower speed limits.

Bicycle Facilities

- Update and continue to implement Nantucket's Bikeway Master Plan.
- Install a comprehensive system of signs for the Island's bike routes.
- Require new development to provide facilities such as bike storage, easements for future bikepaths, etc..
- Implement bicycle safety and registration programs.

Pedestrian Facilities

- Redesign sidewalks, curbing, and pedestrian infrastructure to meet pedestrian access needs.
- Widen sidewalks in heavily trafficked areas.
- Coordinate street furniture, poles, utilities, etc. to prevent barriers to pedestrian flow.
- Encourage walking by establishing marked routes to historic attractions.
- Install safety and directional information signs.
- Distribute promotional information to encourage walking, bicycling, and use of shuttle buses.

Parking Facilities

- Redesign existing parking spaces to minimize traffic flow interruptions.
- Implement a seasonal downtown parking sticker system.
- Expand parking facilities at Surfside and Madaket Beaches.
- Provide boat ramps and on-shore parking facilities for recreational boaters.

Public Transportation

- Establish a seasonal shuttle bus system.
- Improve the links between pedestrian movements and other modes of mass transportation.
- Ensure that adequate transportation service is provided to the elderly and handicapped.
- Coordinate off-island bus and train schedules with the ferry arrival and departures.

Off-Road Bicycling and Walking Facilities

- Provide safe access to beaches through the construction of stairways, trails, etc.

Airborne Facilities

- Provide increased airline connections to regional cities.
- Complete a bike route to the airport.
- Ensure that airline fees are reasonable.
- Improve roadway infrastructure serving the industrial areas surrounding the airport.
- Develop a separate freight landing facility at the Nantucket Airport.
- Examine ferry and airfare rates and policies for fairness with regard to year-round residents' medical and other necessary trips to the mainland.

Waterborne Facilities

- Restrict future increases in vehicular carrying capacity on the Steamship Authority's ferries.
- Redesign the Lower Broad Street gateway to Nantucket from the Steamship Wharf.
- Improve intermodal access (taxis, shuttle buses, etc.) to the ferries.
- Provide better separation of vehicles and pedestrians at the Steamship Wharf.
- Explore strategies to reduce emissions of volatile organic compounds (VOC) from recreational boats.
- Examine the feasibility of separate waterborne freight loading and storage facilities.

NORTHERN MIDDLESEX COUNCIL OF GOVERNMENTS (NMCOG) REGIONAL TRANSPORTATION PLAN SUMMARY

The Long Range Transportation Plan is an overall planning document which identifies and analyzes transportation infrastructure and service improvements that will be needed in the Northern Middlesex area through the year 2020. The geographic area covered by the plan includes the Towns of Billerica, Chelmsford, Dracut, Dunstable, Pepperell, Tewksbury, Tyngsborough, and Westford, and the City of Lowell.

The Plan is the first long range plan for the Region developed since the enactment of ISTEA. The Plan includes new policies and goals which reflect the spirit and intent of ISTEA.

REGIONAL PROFILE

The Northern Middlesex area, composed of the central City of Lowell and eight surrounding towns, is located in the northeastern part of Massachusetts, bordering New Hampshire. Three major highways, Route 3, I-495, and I-93, traverse the Region, providing excellent linkage to the Route 128 belt and Metropolitan Boston, the Lawrence-Haverhill area, and other areas of Eastern Massachusetts and Southern New Hampshire. The current population of the Region is approximately 263,659 persons, based on the 1990 U.S. Census.

During the last three decades, the construction of the highway system along with the suburbanization and outward expansion of the Boston Region northward has resulted in significant growth and development in the region's southern towns (particularly Billerica, Chelmsford, and Tewksbury). Beginning in the 1980s, as large tracts of undeveloped land became scarce in the urbanizing southern communities, the outlying communities of Tyngsborough, Westford, and Pepperell experienced tremendous growth.

Employment patterns in the Northern Middlesex Region have shifted from a traditional manufacturing base to an economy based more on retail and services. This trend is expected to continue through the 1990s.

REGIONAL GOALS

The general transportation goal of the Long Range Plan is to develop a balanced, multi-modal, cost-effective, transportation system connecting points inside and outside the Northern Middlesex Region. The plan also strives to:

- provide safe and convenient transportation service to all area residents, especially the transit dependent groups such as the elderly, low income, and disabled;
- maximize energy conservation, improve air quality and minimize traffic congestion; and
- encourage development patterns consistent with local and regional land use policies.

In order to achieve these goals the following objectives have been adopted in the Plan:

- Improve, maintain, and preserve the existing transportation system and infrastructure.
- Increase integration and connectivity between the various transportation modes.
- Reduce congestion on existing facilities.

- Provide equal accessibility to people with disabilities.
- Provide equitable service to all residents.
- Provide safe and secure transportation facilities.
- Encourage development in areas most suitable and well served by existing transportation services and infrastructure, as is consistent with local and regional land use policies.
- Promote transportation improvements that enhance and foster economic development.
- Plan, design, construct, operate, and maintain the regional transportation system in a manner which is environmentally sound.
- Minimize the use of energy resources.

EXISTING CONDITIONS

In order to develop a transportation plan that will solve the majority of transportation problems, minimize adverse social, environmental and economic impacts, have implementation costs in line with anticipated funding levels, and function as a comprehensive, intermodal transportation network, it is necessary to technically analyze the operating conditions of the overall transportation network. This analysis has been conducted utilizing a computerized travel demand model, the Highway Emulator.

In addition to the computer modelling effort, existing transportation problems have also been identified through various technical studies performed by the NMCOG staff, as well as through input from the Lowell Regional Transit Authority, State transportation agencies, the local communities, and the public participation process.

FUTURE CONDITIONS AND PROBLEM IDENTIFICATION

Future traffic and other transportation needs have been projected through the year 2020. In addition to studying conventional highway and transit projects, the Plan investigates and evaluates the use of alternative forms of transportation such as walking and bicycling. The Plan also discusses the use of transportation demand management strategies such as ridesharing, flextime, telecommuting, and trip reduction ordinances.

ISTEA requires that each state implement six management systems to further identify and detail transportation needs by 1995. These management systems include: pavement, bridges, intermodal, congestion, public transportation, and safety. The implementation of these management systems will provide a primary source of data and information on which to base future planning decisions. Therefore, management systems will provide much of the framework for future refinement of the regional Plan.

ENVIRONMENTAL AND OTHER ISSUES

The projects included in the transportation plan have been analyzed to ensure that they will have positive air quality impacts. The region's planning process has been conducted in accordance with the conformity regulations set forth by the Environmental Protection Agency. These regulations set forth the approach which is to be used in each step of the process of planning, programming, and implementation, including the technical aspects involved in modelling air quality impacts.

Under the provisions of ISTEA, the Long Range Regional Transportation Plan takes on new importance in that all future transportation projects which are funded in part or wholly with federal monies must be included in the Plan. Continuing effort is required to adjust, refine, and update the Plan as necessary in order to remain directed toward achieving the most desirable transportation system for the Region. The Plan, therefore, is not a static document, but an ever-evolving guide to the existing and future transportation needs of the Region.

RECOMMENDATIONS: PROGRAMS AND PROJECTS

Presently, there are no park and ride lots located within the Region. The Plan advocates providing a park and ride lot along the Route 3 corridor and the I-495 corridor. The Plan also identifies the need for additional parking capacity at the Lowell commuter rail station which is currently nearing capacity, and in fact, exceeds 100% occupancy during the fall and winter months.

Of all the highway projects evaluated in the Plan, two regionally significant projects have been shown to have the greatest benefit to the regional transportation network: the Route 3 Improvement Project and the new permanent crossing over the Merrimack River in Lowell. Both of these projects would not only alleviate major traffic congestion problems, but would also have tremendous economic benefit to the Region. By reducing traffic congestion, delays, and air pollution, both projects would serve to make the area more attractive to business, in terms of future locational decisions.

There are a number of transit related projects identified in the Plan. Most of these projects fall into the categories of service improvement and expansion, with capital and operating funding a necessary prerequisite to implementation. All of these projects will be developed with special attention to the intermodal emphasis of ISTEA and the requirements of ADA.

The Plan also advocates the increased development of facilities and programs to promote the use of alternative forms of transportation such as bicycling and walking.

During the upcoming year, the Plan will continue to be refined based on the development of management systems, improvements in the computerized regional travel demand model, and requirements of the Clean Air Act. The public participation process will continue to play an important role in the development of the refined Plan. Public input is crucial in the consensus building and educational process so vital to the successful implementation of the Plan.

OLD COLONY PLANNING COUNCIL (OCPC) REGIONAL TRANSPORTATION PLAN SUMMARY

Federal law requires that all metropolitan areas prepare a long-range transportation plan. The Old Colony Planning Council plan must be formally adopted by the Metropolitan Planning Organization whose members include the Executive Office of Transportation and Construction (EOTC), Massachusetts Highway Department (MHD), Brockton Area Transit Authority (BAT), and Old Colony Planning Council (OCPC) by December 1994. The most recent regional Transportation Plan was completed in 1993. Passage of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), the Clean Air Act Amendments of 1990 (CAAA) and the Americans with Disabilities Act of 1990 (ADA) requires an evaluation of the OCPC region's transportation goals, policies, fiscal resources, and project priorities. This plan is an updated version of the 1993 plan.

REGIONAL PROFILE

The Old Colony Planning District consists of fifteen communities located in southeastern Massachusetts. These communities consist of one city (Brockton) and fourteen towns. The greatest concentration of population and economic activity is in Brockton (1990 population 92,788) with 31.3% of the total population and a comparable proportion of the region's nonresidential activity. To the southeast, Plymouth (1990 population 45,608) has 15.4% of the total population and comparable non-residential uses making it the second largest concentration of housing and other activities. The intervening communities are much smaller, giving the Region its asymmetrically bi-nodal character.

Generally speaking, non-residential land use is in proportion to the population. However, an increasing amount of major retail activity is away from the center or the regional transit system (BAT). This overall trend is summarized by the fact that while the city of Brockton gained over 2,350 jobs from 1980 to 1990, its share of regional employment dropped from over 53% to 35% during that period. During the same period the City's share of the region's population dropped from 34.45% to 31.35%. These trends, plus the greater interaction with the rest of the Greater Boston metropolitan area, have increased travel demands.

The 1990 population of 296,864 was a 7.2% increase over the 1980 regional population. During that time the population of the City of Brockton and the towns of Avon, Stoughton and Whitman decreased by 2.5%, 9.3%, 0.3% and 2.2% respectively. The Town of Plymouth experienced the greatest growth with an increase of 27%.

The overall labor force that is 16 years and older in the Old Colony Region totalled 159,655 in 1990. Of this total, 53% were males and 47% were females. Most of the area towns experienced an overall increase in employment since 1980. The exceptions to this regional trend were East Bridgewater, Plympton, and Whitman, which had a net loss of jobs.

While the median household income of the OCPC Region increased 19.27% since 1980, the State's Median Household Income declined by 2.74%. Median family income increased 21.64% since 1980 while the state increased 15.21%. The OCPC Region per capita income also increased 38.10% since 1980, which is considerably higher than the state level and the same level as Brockton's Primary Metropolitan Statistical Area. Population emigration trends in the face of a sluggish employment market are indicative of the growing role of the region's communities to function as "bedroom suburbs" for the Boston and Route 128

employment centers. People moving into the area from Metropolitan Boston typically remain employed outside the Region.

Over the last ten years the OCPC Region has seen a significant change in travel patterns. Based on the U.S. Census, 68.27% of commuters drove alone in 1980; by 1990 this percentage rose to 79.27%. Transit share of work trips in the OCPC Region decreased from 4.58% in 1980 to 3.48% in 1990.

The OCPC journey-to-work data indicated that there were 183,911 total work trips in the Region. Approximately 144,888 person work trips originated in the Region and approximately 39,023 originated outside the OCPC Region.

REGIONAL GOALS

This Transportation Plan represents the MPO's effort to craft a document and a process that meet the challenges of preserving and expanding a truly intermodal transportation system. It includes the policies, goals, analyses, and recommendations necessary to build and maintain an efficient, effective, and affordable regional transportation system. It is the intention of the MPO to build on the current system, working to make it comprehensive and fully integrated. The goal is a balanced range of well-connected transportation options that will use the best of each travel mode: auto, transit, air, rail, truck, boat, pedestrian, and bicycle. This plan identifies transportation project needs for the next twenty plus years in the OCPC Region.

The Regional Transportation Plan recommends studies and specific short-term and long-term project priorities that are needed to maintain the existing transportation infrastructure and produce a more balanced, safe, and affordable regional transportation system. The principal way in which Transportation Plan recommendations will be translated into action is through the TIP.

OCPC will assist the Massachusetts Highway Department in developing management systems to provide information needed to make effective decisions. In addition, a Traffic Monitoring System for highways, transportation facilities, and equipment must be developed and implemented. MPOs shall be given appropriate opportunities for involvement, establishment and implementation of each management system. The level of contribution, participation, and effort required of the MPO's may vary for each of the management systems.

EXISTING CONDITIONS

The following sections describe the existing regional transportation system and the problems related to the system.

Bicycle Transportation

The Boston to Cape Cod Bikeway is the major bike route of both the Old Colony Region and eastern Massachusetts. This multi-regional facility extends for 52 miles from the Avon/Stoughton town line to the Cape Cod Canal. Throughout the Region, the Boston to Cape Cod Bikeway functions as a bike route or Class III facility. The alignment traverses existing roadways and is designated by signs.

Pedestrian Transportation

In terms of pedestrian facilities, there are no dedicated facilities in the OCPC Region which serve a regional transportation function. Pedestrian facilities are located in various OCPC communities within their Central Business Districts. They are generally located on functionally classified roadways.

Goods Movement

Rail and truck operations constitute the principal freight modes in the OCPC Region. The flow of commodities generally has interregional and interstate destinations. The largest number of trucking terminals in the Region are located in Brockton, Avon, Stoughton, and West Bridgewater.

Air Transportation

Plymouth Airport is the only public airfield in the OCPC Region. The airport functions as a general aviation facility serving private operators and individuals. In recent years, the number of take-offs and landings recorded at this site has demonstrated a marked growth. This rapid expansion coincides with a national trend of increased general aviation activity.

Waterborne Transportation

The Port of Plymouth serves as the center for marine transportation in the Old Colony Region. Harbor activities pertain primarily to commercial fishing and recreational boating. The port contains two landing areas: Plymouth Harbor and North Plymouth Harbor. Between 1972 and 1977, the total tonnage of waterborne freight utilizing local facilities declined significantly, but has since stabilized.

Mass Transit

Because of the region's population growth and heavy reliance on Boston for employment, access to Boston is an important priority. Area highway and transit facilities do not meet existing and future needs for access to Boston.

Federal approval of the Environmental Impact Statement for the rehabilitation of commuter rail service in the Old Colony Region constitutes one large step toward improving intermodal transportation south of Boston and reducing highway congestion. The \$480 million project will reactivate commuter rail service on both the Middleborough Line and the Plymouth Line in 1996. In terms of fixed-route bus service, extensions into outlying communities would greatly increase the usefulness of the system but are constrained by a lack of funds and demand.

Currently, eight of fifteen communities receive DIAL-A-BAT service in the OCPC Region. DIAL-A-BAT communities which join BAT for the provision of DIAL-A-RIDE services (demand responsive or subscription) find it to be more economical than operating the service itself through their respective Councils on Aging.

Highways

The analysis identified a total of 131 intersections experiencing congestion and/or safety problems and requiring mitigation.

The overall historic traffic growth rate for the OCPC Region has been approximately 2% annually. Future traffic growth will not be uniform throughout the Region. It is expected that there will be wide variation from place to place. Some roads will experience major increases while others will experience little or no change.

Corridor segments with capacity problems were identified through review of the various studies undertaken since 1981. Among the worst corridor segments in terms of capacity are sections of the following state numbered routes: 3, 18, 24, 27, 28, 106, 123, 138, and 139.

FUTURE CONDITIONS AND PROBLEM IDENTIFICATION

The future condition of the transportation system in the OCPC area is dependent upon the implementation of this plan. Increased population will put more strain on the highway system throughout the Region, increasing the need for additional capacity and higher performance. Problems which do not now exist are going to manifest themselves in the future in the form of intersection safety problems, corridor congestion and safety, town center congestion, and the physical deterioration of the existing structures and roadways. OCPC's recommendations are geared to avoiding these problems and dealing with any that have already occurred. OCPC has planned 87 long-term highway projects and 52 long-term bridge projects.

One of the biggest transportation challenges facing Southeastern Massachusetts is the difficulty of east-west travel. Route 44 is the major east-west arterial in the Region. A new interchange at Route 3 is currently under construction. Route 44 between Route 3 and Route 495 will be replaced with a divided highway which will intersect Route 3 at a location slightly north of the current location. Next to the Central Artery/Third Harbor Tunnel, this is the largest highway project in the Commonwealth and assures greater access to southeastern Massachusetts.

ENVIRONMENTAL AND OTHER ISSUES

The following environmental issues are important to the OCPC:

Air Quality

Overall, in accordance with the provision of CAAA, OCPC has determined that the implementation of the Regional Transportation Plan satisfies the conformity criteria and is consistent with the Massachusetts State Implementation Plan.

Water Quality

Protecting water resources is important for a better quality of life, economic development, recreational activities, wildlife and plant protection, and public and private water supplies. MHD is in the process of developing a policy to address the protection of wetlands, control of stormwater runoff, and the use of road salts.

RECOMMENDATIONS: PROGRAMS AND PROJECTS

Recommended programs and projects are as follows

Highway

- maintain and improve existing infrastructure;
- OCPC advocates additional studies to address congestion problems on Route 24 and Route 3;
- OCPC advocates improved east-west access in the Region through the widening of Route 106 in West Bridgewater and widening of Route 123 in Brockton;
- initiate improvement strategies for enhancing traffic circulation in Downtown Brockton, Stoughton Square, Bridgewater Center, Plymouth Center, and Whitman Center;
- OCPC supports intermodal facilities, pedestrian and bikeways, corridor improvements and bridge reconstruction/rehabilitation;
- OCPC supports and endorses the Route 44 relocation project; and
- OCPC supports the Route 3 reconstruction project from Route 18 in Weymouth to Route 14 in Duxbury.

Mass Transit

- OCPC supports studies considering the feasibility of establishing intercity bus service between Brockton and Taunton and Brockton and Plymouth;
- OCPC supports the Old Colony Rail Rehabilitation Project;
- OCPC advocates further extension of the commuter rail into the Region; and
- OCPC supports increased promotion of ridesharing, HOV lanes, employer sponsored trip reduction plans and use of alternative forms of energy.

Paratransit Service

- OCPC endorses BAT's efforts to expand DIAL-A-BAT operations.

Bicycle Transportation

- Efforts should be made to identify, designate, and implement additional bicycle paths and routes.

Goods Movement

- OCPC encourages the development of policies which will serve to expedite the movement of goods within and through the Region in an effort to further realize its economic potential.

Air Transportation

- OCPC encourages the use of smaller general aviation airports in the Region.
- OCPC recommends a study of the potential for municipal airports to serve as freight terminals.

Waterborne Transportation

- OCPC recommends the development of additional public moorings in Plymouth Harbor.
- OCPC recommends that a feasibility study be conducted to examine the potential for expanding facilities at North Plymouth Harbor.

This Plan addresses all modes of transportation, the demands placed upon them, and solutions for the problems that will likely be encountered. In conclusion, this Transportation Plan is designed to meet the transportation needs of the Old Colony Planning Council District for the next twenty-five years.

PIONEER VALLEY PLANNING COMMISSION (PVPC) REGIONAL TRANSPORTATION PLAN SUMMARY

The 1993 Regional Transportation Plan (RTP), created by the Pioneer Valley Planning Commission (PVPC), outlines the direction of transportation planning and improvements for the Pioneer Valley Region through the year 2020. The RTP provides an up-to-date inventory of the transportation infrastructure as well as a comprehensive examination of transportation issues and opportunities affecting the Region. A variety of strategies are offered to meet transportation needs and improve the transportation system.

These strategies are put into action via planning activities such as the TIP and the Unified Planning Work Program.

REGIONAL PROFILE

The Pioneer Valley Region is located in the mid-western section of Massachusetts covering 1,178 square miles, roughly the size of the state of Rhode Island; it is the second largest metropolitan area in Massachusetts encompassing 43 communities from Hampden and Hampshire counties and over 600,000 residents. The Region is located at the interchange of the Massachusetts Turnpike (east-west) and Interstate 91 (north-south), known as the "crossroads of New England," offering easy access to all markets in the eastern United States and Canada. Springfield, the third largest city in Massachusetts, is the Region's cultural and economic center, and is home to the Region's twenty largest employers. The cities of Holyoke and Chicopee were the first planned industrial communities in the nation. Many of the historic structures in these cities are still maintained although most mills and industries are now gone. This is due to the shift from a primarily manufacturing to a service based economy. Pioneer Valley is also home to many rural communities along the foothills of the Berkshires and eastern portion of the Region.

A wealth of economic, historical, and environmental attractions are located throughout Pioneer Valley. The Milton Bradley Company, Basketball Hall of Fame, University of Massachusetts Amherst Campus, and the Connecticut River are just a few unique features that make this Region an exceptional place to work and live.

REGIONAL GOALS

The following statement expresses the overall goal of the RTP:

"The Pioneer Valley should strive to attain a safe and dependable transportation system for the efficient movement of people and goods within and throughout the Region that is: multimodal, coordinated, energy efficient, environmentally sound, and cost effective."

The RTP contains objectives that have been developed to meet and maintain this goal. The following is a sampling of the Region's transportation system objectives:

- Development of multimodal passenger transportation facilities in the Region's urban areas which connect with and service commercial, industrial, and high density residential centers.
- Development of a regionwide system of trails and facilities for non-motorized use only.

- Development of a rural roadway system with its primary emphasis on providing access for rural residents to rural town centers, regional transit service, and the region's urban areas.
- Minimize the amount of energy consumed per unit of people or goods moved in the Region. Average vehicle miles travelled and average daily traffic reductions can be realized by increased people and/or goods being carried per vehicle.
- Application of management systems to address deficiencies in a strategic approach. Life cycle cost analysis and financial constraint components of the decision-making process should be developed and applied systematically.

EXISTING CONDITIONS

The Pioneer Valley contains 4,283 miles of roadway that are functionally classified according to the service they are intended to provide. Presently, there are no plans to significantly expand the Region's infrastructure. Priority is directed to maintaining and improving the present infrastructure. Maintenance responsibilities for these roadways is as follows, 77.4% by communities, 11.7 % by private organizations, 6.9% by the Massachusetts Highway Department,, and 4% by other organizations.

The Pioneer Valley contains 677 bridges which have been rated according to the American Association of State Highway and Transportation Officials bridge rating system. Of the Region's bridges, 53% are non-deficient, 33% are functionally obsolete, and 14% are structurally deficient. At the present time, the bridges rated as structurally deficient are a focal point of concern.

The Pioneer Valley Transit Authority (PVTa) is the leader in providing local transit service in the Region. Currently, PVTa offers service to 21 communities in Hampden and Hampshire counties. The PVTa operates a fleet of 175 fixed route buses and had a total ridership of 11,150,782 in 1992. In addition to PVTa, there is a variety of private carriers providing service within and outside of the Region, including Bonanza, Greyhound, Peter Pan, and Vermont Transit.

The Region is well served by air transport facilities. These airports include the Agawam-Springfield Seaplane Harbor, Barnes Municipal, Bradley International, Metropolitan, Northampton, and Westover Airforce Base.

There is one major passenger and five freight rail carriers within the Pioneer Valley Region. Passenger service is provided by Amtrak with a station located in downtown Springfield. The five major freight rail carriers providing service in the Region are Conrail, Guilford Transportation Industries, Central Vermont Railways Inc., Pioneer Valley Railroad, and Massachusetts Central Railroad.

Non-motorized transportation has recently become an increasingly attractive mode with the recent opening of the 8.5 mile long Norwottuck Rail Trail. Currently the Pioneer Valley Region has 14.5 miles of bikeway facilities with a number of new proposals to expand the network.

FUTURE CONDITIONS AND PROBLEM IDENTIFICATION

The RTP addresses the Region's needs and concerns through the year 2020 and is divided into two components, the Short Range Element (SRE) and the Long Range Element (LRE). The SRE provides an outline of the transportation needs of the Pioneer Valley Region over the first five years of the plan and provides a prioritized project listing that is financially constrained and provides the basis for the Pioneer Valley Region TIP. The LRE extends beyond the SRE to the year 2020. A long range financial plan is included in this section that contains estimated future apportionments for the Region. Based on historical data, it is estimated that the Pioneer Valley Region will implement over \$900 million in project funds over the period of 1998-2020. This information is used to establish financially constrained priorities for future improvement of the transportation infrastructure in the Pioneer Valley Region.

The LRE has set forth a set of priorities of improvement activity for the Region addressing the areas of safety, congestion relief, preservation, enhanced mobility, and environmental improvement. The following is a sampling of these priorities.

- The highest priority within the Pioneer Valley Region related to safety is the rehabilitation of the bridge system. There are 94 bridges (14%) in the Region that are rated as structurally deficient. The plan of action for the Region is to address the deficiencies in a timely manor before conditions deteriorate to unsafe and/or irreparable conditions. Also, intersections within the Region listed on the state's top 1,000 high accident locations will be examined followed by proposed improvements to eliminate hazardous conditions.
- Areas of congestion will be identified through regional corridor studies and local input. An established set of performance measures will be used to evaluate the level of severity of each area. Priority will be given to the relief of those corridors that are designated as congested.
- The preservation of the Region's infrastructure is of major concern to the Pioneer Valley Region. The Region will expand upon its Pavement Management System (PMS) to provide effective strategies for maintaining its roadway surfaces. Projects will need to undergo PMS analysis and be prioritized to be considered for federal funding. A Bridge Management System will also be employed to address the deteriorating bridge infrastructure throughout the Region and State.
- Increasing the movement of people by non-motorized modes, relieving traffic congestion, promoting intermodal usage, and environmental benefits, are of great importance to the Pioneer Valley Region. A long range non-motorized plan will be developed for the Region to create and maintain a network of non-motorized transportation facilities throughout the Region. This will encompass all non-motorized modes of travel from walking to canoeing and incorporate intermodal connections such as Bikes On Transit.
- The CAAA and ISTEA promote strategies to achieve reductions in vehicle use and lower emissions from vehicles. The RTP addresses methods such as travel demand management, traffic control measures, and alternate modes to reduce vehicle trips and vehicle miles travelled, thereby decreasing the amount of automobile emissions. Also, attention will be paid to approaching the air quality problem through land use development strategies.

ENVIRONMENTAL AND OTHER ISSUES

The RTP addresses numerous issues impacting the transportation system throughout the Pioneer Valley Region. Included are issues related to environmental impacts, transit, transportation of goods, management systems and design standards. The following is a sampling of the issues addressed by the RTP.

- The CAAA require that all designated areas that failed to meet the National Air Quality Standards for ozone and carbon monoxide (CO) to develop a plan that will reduce 1990 emission levels 15% by the year 1996. The entire Pioneer Valley Region is classified non-attainment for ozone, while the City of Springfield is the only non-attainment area for CO in the Region. To achieve the ozone and CO reduction targets, strategies to be considered include: enhanced inspection and maintenance of vehicles, trip reduction, and traffic control measures. Enhanced inspection and maintenance would require vehicles to be tested for emissions more thoroughly and to a greater degree than at the present. Enforcement of the Massachusetts law requiring employers of 250 or more to institute trip reduction strategies will be explored. Also, improvement to existing traffic operations will be addressed as traffic control measures to improve air quality.
- The Americans with Disabilities Act of 1990 addressed specific actions to be taken by transit providers. For example, all newly purchased or leased vehicles used in fixed-route service must be accessible, remanufactured vehicles must be more accessible to the maximum extent feasible, and paratransit service must be provided to disabled individuals unable to use the fixed-route system. The Pioneer Valley Region will ensure that these requirements are adhered to by all transit providers and Amtrak passenger service.
- Trucking remains the primary mode of transportation for the movement of goods in the Pioneer Valley Region. The Region's railroads have not reached their full potential within the Region at the present time for a number of reasons including an image of railroads as a slow, inefficient, and non-competitive mode for the movement of goods and the lack of strong commitment by federal, state, and local officials to promote rail use and/or increase funding. The Pioneer Valley Region will strive to overcome this misconception and rejuvenate rail as an efficient and competitive mode for the transportation of goods.
- There is a continuing need for a systematic approach to prioritizing and implementing infrastructure improvements throughout Massachusetts and the Pioneer Valley Region. In cooperation with the State, the Region will incorporate regionwide management systems as regulated under ISTEA. These management systems will include bridge, congestion, intermodal, pavement, public transportation and safety.
- The Federal Highway Administration and MHD adopted roadway designs that suit the capacity and safety needs of each roadway functional class. The design standards need to be revisited so that all areas are considered, including rural communities. Presently, the design standards for many arterials passing through rural areas require excessive travel widths and shoulders. For these communities to exercise their right to the application of federal highway funds, extensive widening and destruction of scenic character may be necessary. The highway design standards should be changed to specifically address the needs of rural communities and do so without sacrificing safety.

RECOMMENDATIONS: PROGRAMS AND PROJECTS

The projects listed below were recommended as part of the Pioneer Valley TIP.

Major short range projects:

- Connecticut River Walk;
- Reconstruction of Route 57 in Agawam;

- Rehabilitation of the South End Bridge in Agawam and Springfield;
- Bus replacements;
- Reconstruction of Shwinigan Drive in Chicopee and Ludlow;
- Rehabilitation and widening of the Calvin Coolidge Bridge and Route 9 in Hadley and Northampton;
- Reconstruction of Route 66 from Huntington to Northampton;
- Improvements to the Town Common Area in South Hadley;
- Reconstruction of Boston Road (Route 20) in Springfield;
- Reconstruction of Route 21 in Springfield;
- Reconstruction of Route 5 in West Springfield and Holyoke; and
- Route 91 and Route 5 Interchange.

By the year 2020 it is expected there will be a number of roadway capacity deficiencies throughout the Pioneer Valley Region. The following is a sampling of these areas of potential deficiencies:

- Route 116 from Sunderland Road to the Sunderland Town Line in Amherst;
- Interstate 91 from the Springfield city line to Interstate 391 in Chicopee;
- Route 32 from Route 20 to Thorndike Street in Palmer;
- Route 57 from the Agawam town line to Powder Mill Road in Southwick;
- Route 10/202 from Pochassic Street to Meadow Street in Westfield; and
- Route 20 from Elm Street to the North End Bridge Rotary in West Springfield.

The Regional Transportation Plan explores all aspects of the transportation system, identifies deficiencies, and sets priorities. The Short and Long Range Elements of the RTP establish the direction of transportation improvements over the next thirty years. As a start, deficiencies identified under the long range forecast will be the focus of applying these priority improvement actions. The Pioneer Valley Region will continue to implement sound strategies striving towards a transportation system that is intermodal, cooperative, energy efficient, environmentally sound, and cost effective in accordance with the overall goals of the RTP.

SOUTHEASTERN REGIONAL PLANNING AND ECONOMIC DEVELOPMENT DISTRICT (SRPEDD) REGIONAL TRANSPORTATION PLAN SUMMARY

The Southeastern Regional Planning and Economic Development District (SRPEDD) serves 27 cities and towns in southeastern Massachusetts. SRPEDD's primary responsibility is to provide comprehensive planning services for its member communities, including transportation planning.

Agencies in the Region involved most directly in transportation planning include: the Joint Transportation Planning Group, the Greater Attleboro-Taunton Regional Transit Authority, and the Southeastern Regional Transit Authority.

REGIONAL PROFILE

The industrial mix of Southeastern Massachusetts (agriculture, fishing, manufacturing, and high technology) is representative of the prevalent industrial mix throughout the state.

Unemployment in the region's two largest cities, New Bedford and Fall River, reached 13% in 1992 and has shown little or no improvement in 1993. As a result of this urban decline, growth in the Region is expected to be slow over the next fifteen years. A key period for the Region will be between 2005 and 2010, when substantial job growth is forecast for the region, primarily in the towns. The major factor behind this expected growth is the region's superior highway network. Additional catalysts to growth are the re-activation of the Old Colony commuter rail line to Boston, the expansion of the New Bedford Regional Airport, and further development of tourist attractions.

REGIONAL GOALS

SRPEDD's Transportation Plan (T-Plan) proposes to: 1) effectively address the area's current and future travel needs from both a transportation management and a growth management perspective, and 2) develop and maintain an effective, accessible transportation system which operates in a safe, economical, efficient, and environmentally sound manner while also providing a range of modal choices for people and freight.

EXISTING CONDITIONS

The sections that follow describe the existing regional transportation system and the problems related to it.

Traffic Congestion/Safety

Concentrated commercial development has become the primary cause of traffic congestion in the Region, affecting several major corridors, such as Routes 1, 6, and 44. Safety and congestion problems, combined with a lack of full access at some locations, currently exist at interchanges along Routes 24, 140, and Interstates 95, 195, and 495. Traffic congestion in the Region is primarily confined to the peak periods, especially the PM peak travel period. There are 43 safety and congestion problems identified that

the T-Plan recommends for action. Nearly 10% of the top 1,000 high-accident intersections, statewide, are located in the SRPEDD Region. Of the region's functionally classified road network, 265 miles or 22% exceed the statewide average accident rate.

Bridges

The three movable bridges in the Region are in poor condition, requiring major rehabilitation or replacement. Replacement is planned for the Brightman Street Bridge and the Berkley-Dighton Bridge. Major rehabilitation is planned for the New Bedford-Fairhaven Route 6 Bridge.

Airports

The SRPEDD Region lacks facilities to accommodate air freight service that might benefit local economies. Although demand for this service has not yet been identified, feasibility studies are underway by the Massachusetts Aeronautics Commission to determine if New Bedford Regional Airport warrants expansion to serve regional cargo needs.

Pavement Management

The SRPEDD Road Surface Management System estimates that 67% of all pavement surveyed is in good condition and 33% in fair-to-poor condition. Of the roads that are part of the Federal Aid system, approximately 74% surveyed are good, while 26% are poor.

Demand-Responsive Transit

Demand for paratransit service in the primarily urban Southeastern Regional Transit Authority (SRTA) area increased 113% over the last five years, with paratransit demand representing 2% of all SRTA transit trips in FY92. In the mostly rural Greater Attleboro-Taunton Regional Transit Authority (GATRA) area, paratransit demand increased 35% over the same five year period, representing 27% of all GATRA trips.

Fixed Route, Intercity and Commuter Bus

SRTA's annual fixed-route ridership is about 2.5 million passengers; GATRA's is approximately 500,000 passengers per year.

Funding constraints continue to limit the operations of the RTAs. The annual federal subsidy for operations has been "capped" for several years and federal funds for operating costs are expected to be further reduced in the future. Available funds are not sufficient for the replacement and maintenance of buses.

Commuter express buses carry about 47% of all work trips (about 2,700 persons) from Taunton, Fall River, and New Bedford to downtown Boston.

Rail

The three MBTA commuter rail stations in the SRPEDD Region are in Mansfield, Attleboro Center, and South Attleboro. There is a need for more parking space at South Attleboro and Mansfield. The waiting room at the Mansfield station is limited, and South Attleboro does not have an enclosed waiting area. Fixed route bus connections from RIPTA or GATRA are non-existent at the South Attleboro station and GATRA has no connections from the Mansfield station.

FUTURE CONDITIONS AND PROBLEM IDENTIFICATION

Road Network

A slow increase in population, housing, and employment in the Region is projected over the next 30 years. Traffic conditions due to vehicle miles travelled growth after the turn of the century will place a burden on some of the principal arterial roads in the Region, particularly Interstate 95, Route 24, and Route 44 and many of the lesser arterial and collector roads, such as Routes 152 and 123 in Attleboro, and Route 6 in Dartmouth.

Demand-Responsive Transit

Substantial increases in elderly and mobility-limited populations will continue to characterize the demand for paratransit services throughout the Region. However, local and state budgetary constraints hamper the expansion of this service in rural areas and concentrate paratransit investments in urban areas where the Americans with Disabilities Act (ADA) makes the service mandatory. This trend raises concern over how to address the future mobility needs of persons who are not ADA-eligible but are elderly and/or mobility-limited. Both RTAs will need additional sources of revenue if they are to maintain the present level of service.

Fixed Route, Intercity and Commuter Bus

Population, employment, and businesses shifts from urban to suburban locations make fixed-route bus service increasingly expensive. As single family home populations increase and urban populations decrease, trip patterns will continue to be scattered throughout rural areas that cannot reasonably be served by fixed-route or intercity transit.

The demand for fixed-route service between Massachusetts and Rhode Island will greatly increase in the future as the economy of the greater Providence area rebounds.

Rail

The MBTA's Old Colony commuter rail line to Lakeville (to begin operation in 1996) will attract commuters from locations along I-495. This should partly satisfy the increased demand for transit between the SRPEDD Region and Boston during the depression of the Central Artery. MBTA commuter rail service will be extended to Taunton, New Bedford, and Fall River sometime between 2005 and 2010.

ENVIRONMENTAL AND OTHER ISSUES

Eastern Massachusetts has been designated as an ozone non-attainment area that is classified by the Environmental Protection Agency as "serious." To evaluate the impact of the T-Plan on the State Implementation Plan for air quality, SRPEDD has conducted an air quality analysis, per EPA guidance. The results of this analysis demonstrated that:

- Volatile organic compounds (VOC) and oxides of nitrogen (NO_x) emission from the build scenario to the no-build scenario for all analysis years;
- The VOC emissions from the action scenario are less than the 1996 and 1999 VOC mobile source emission budget for analysis years 1996 through 2020;
- The NO_x emissions for the action scenario are less than the 1990 NO_x mobile source emissions budgets for analysis years 1999 and 2020; and
- For all analysis the action scenario contributes to a reduction from the 1990 inventory by non-zero amount for both VOC and NO_x.

Park-and-Ride Lots

At present, none of the lots in the Region are operating at capacity, but if carpooling returns to previous levels, new park-and-ride locations will be needed. To encourage use of park-and-ride lots, the T-Plan recommends that new lots be created along I-95, I-195 and I-495, where easy accessibility makes these superior locations.

Ferry Service to Islands

There may be opportunities to establish New Bedford as an alternate port for ferry service to Martha's Vineyard, in addition to current seasonal passenger service.

Bicycle and Pedestrian

The T-Plan concludes that existing roadways are too narrow to safely accommodate bicyclists and recommends the development of bicycle paths.

Pedestrian accessibility to transit, central business districts and shopping facilities should also be incorporated into future roadway projects and developments.

RECOMMENDATIONS: PROGRAMS AND PROJECTS

The creation of more intercity bus routes in the SRPEDD Region would provide a benefit to the subregional economic structure. It is essential that Rhode Island and Massachusetts actively cooperate in extending their bus service to each other's populations and shopping areas. SRPEDD recommends extending MBTA commuter rail service from Boston to the metropolitan areas of Taunton, Fall River, and New Bedford.

A major investment is called for in providing SRTA with new or vastly improved maintenance facilities within the next five years.

Route 24 and I-95 require special attention over the next 20 years to upgrade interchanges and accommodate expected traffic growth. The development of an extended High Occupancy Vehicle Lane system needs to be studied for both routes, all the way into Boston.

It is anticipated that the \$70+ million relocation of Route 44 from Carver to Plymouth will continue to be a catalyst for an increase in and stability of regional employment, as well as the solution to numerous safety and congestion problems.

APPENDIX A

METROPOLITAN PLANNING ORGANIZATION MEMBERS

STATEWIDE MEMBERS OF ALL MPOs

Executive Office of Transportation
and Construction
10 Park Plaza
Boston, MA 02116
Telephone: (617) 973-7000
FAX: (617) 523-6454
TDD: (617) 973-7306

Massachusetts Highway Department
10 Park Plaza
Boston, MA 02116
Telephone: (617) 973-7800
TDD: (617) 973-7306

BERKSHIRE COUNTY MPO

Berkshire County Regional Planning
Commission
10 Fenn Street
Pittsfield, MA 01201
Telephone: (413) 442-1521
FAX: (413) 442-1523

Berkshire Regional Transit Authority
67 Downing Parkway
Pittsfield, MA 01201
Telephone: (413) 499-2782
FAX: (413) 442-2536
TDD: (413) 448-2108

BOSTON MPO

Metropolitan Area Planning Council
60 Temple Place
Boston, MA 02111
Telephone: (617) 451-2770
FAX: (617) 482-7185

Massachusetts Bay Transportation Authority
10 Park Plaza
Boston, MA 02116
Telephone: (617) 722-3200
TDD: (617) 722-5415

Massachusetts Port Authority
10 Park Plaza
Boston, MA 02116
Telephone: (617) 973-5500
TDD: (800) 831-1206

MBTA Advisory Board
10 Park Plaza
Boston, MA 02116
Telephone: (617) 426-6054
FAX: (617) 451-2054

CAPE COD MPO

Cape Cod Commission
3225 Main Street
Barnstable, MA 02630
Telephone: (508) 362-3828
FAX: (508) 362-3136

Cape Cod Regional Transit Authority
585 Main Street - P. O. Box 2006
Dennis, MA 02638
Telephone: (508) 385-8311
FAX: (508) 385-1812
TDD: (800) 385-7511

CENTRAL MASSACHUSETTS MPO

Central Massachusetts Regional Planning
Commission
20 Washington Square, Suite 300
Worcester, MA 01604-4013
Telephone: (508) 756-7717
FAX: (508) 792-6818

Worcester Regional Transit Authority
287 Grove Street
Worcester, MA 01605
Telephone: (508) 791-2389
FAX: (508) 752-3153
TDD: (508) 791-6401

FRANKLIN COUNTY

Franklin County Planning Department
Court House
425 Main Street
Greenfield, MA 01301
Telephone: (413) 774-4015
FAX: (413) 774-3169

Franklin Regional Transit Authority
474 Main Street
Greenfield, MA 01301
Telephone: (413) 774-2262
FAX: (413) 772-2262

Greenfield - Montague Transportation Area
382 Deerfield Street
Greenfield, MA 01301
Telephone: (413) 774-5195
FAX: (413) 774-2111
TDD: (413) 774-2262

MARTHA'S VINEYARD

Martha's Vineyard Commission
P.O. Box 1447
Oak Bluffs, MA 02557
Telephone: (508) 693-3453
FAX: (508) 693-7894

Martha's Vineyard Transit Authority
P.O. Box 2278
Edgartown, MA 02539
Telephone: (508) 627-9663
FAX: (508) 627-7506
TDD: (508) 693-4633

MERRIMACK VALLEY MPO

Merrimack Valley Planning Commission
160 Main Street
Haverhill, MA 01830
Telephone: (508) 374-0519
FAX: (508) 372-4890

Merrimack Valley Regional Transp. Authority
85 Railroad Avenue
Bradford, MA 01830
Telephone: (508) 373-1184
FAX: (508) 373-1184
TDD: (800) 244-2713

MONTACHUSETT MPO

Montachusett Regional Planning Commission
R 1427 Water Street
Fitchburg, MA 01420
Telephone: (508) 345-7376
FAX: (508) 345-9867

Montachusett Regional Transit Authority
R 1427 Water Street
Fitchburg, MA 01420
Telephone: (508) 345-7376
FAX: (508) 345-9867
TDD: (800) 789-0577

NANTUCKET

Nantucket Planning and Economic
Development Commission
One East Chestnut Street
Nantucket, MA 02554
Telephone: (508) 228-7233
FAX: (508) 228-7236

Nantucket Regional Transit Authority
Town and County Building
Nantucket, MA 02556
Telephone: (508) 228-7272

NORTHERN MIDDLESEX MPO

Northern Middlesex Council of Governments
Gallagher Terminal
Floor 3B 115 Thorndike Street
Lowell, MA 01852
Telephone: (508) 454-8021
FAX: (508) 454-8023

Lowell Regional Transit Authority
145 Thorndike Street
Lowell, MA 01852
Telephone: (508) 459-0164
FAX: (508) 458-9673
TDD: (800) 439-2370

OLD COLONY MPO

Old Colony Planning Council
70 School Street
Brockton, MA 02401
Telephone: (508) 583-1833
FAX: (508) 559-8768

Brockton Area Transit Authority
70 School Street
Brockton, MA 02401
Telephone: (508) 588-2240
FAX: (508) 584-1437
TDD: (508) 586-0009

PIONEER VALLEY REGION

Pioneer Valley Planning Commission
26 Central Street
West Springfield, MA 01089
Telephone: (413) 781-6045
FAX: (413) 732-2593

Pioneer Valley Regional Transit Authority
2808 Main Street
Springfield, MA 01107
Telephone: (413) 732-6248
FAX: (413) 737-2954
TDD: (800) 922-0178

SOUTHEASTERN MASSACHUSETTS MPO

Southeastern Regional Planning and
Economic Development District
88 Broadway
Taunton, MA 02780
Telephone: (508) 824-1367
FAX: (508) 880-7869

Southeastern Regional Transit Authority
25 North Sixth Street
New Bedford, MA 02740
Telephone: (508) 997-6767
FAX: (508) 993-9196
TDD: (508) 999-5810

Greater Attleboro - Taunton Regional Transit
Authority
Seven Mill Street
Attleboro, MA 02703
Telephone: (508) 226-1102
FAX: (508) 226-4937
TDD: (508) 824-7439

APPENDIX B

REGIONAL MEMBER COMMUNITIES

BERKSHIRE COUNTY

(32 Communities)

Adams	Lanesboro	Richmond
Alford	Lee	Sandisfield
Becket	Lenox	Savoy
Cheshire	Monterey	Sheffield
Clarksburg	Mount Washington	Stockbridge
Dalton	New Ashford	Tyringham
Egremont	New Marlboro	Washington
Florida	North Adams	West Stockbridge
Great Barrington	Otis	Williamstown
Hancock	Peru	Windsor
Hinsdale	Pittsfield	

METROPOLITAN BOSTON

(101 Communities)

Acton	Hopkinton	Randolph
Arlington	Hudson	Reading
Ashland	Hull	Revere
Bedford	Ipswich	Rockland
Bellingham	Lexington	Rockport
Belmont	Lincoln	Salem
Beverly	Littleton	Saugus
Bolton	Lynn	Scituate
Boston	Lynnfield	Sharon
Boxborough	Malden	Sherborn
Braintree	Manchester-by-the-Sea	Somerville
Brookline	Marblehead	Southborough
Burlington	Marlborough	Stoneham
Cambridge	Marshfield	Stoughton
Canton	Maynard	Stow
Carlisle	Medfield	Sudbury
Chelsea	Medford	Swampscott
Cohasset	Medway	Topsfield
Concord	Melrose	Wakefield
Danvers	Middleton	Walpole
Dedham	Milford	Waltham

(METROPOLITAN BOSTON, CONTINUED)

Dover	Millis	Watertown
Duxbury	Milton	Wayland
Essex	Nahant	Wellesley
Everett	Natick	Wenham
Foxborough	Needham	Weston
Framingham	Newton	Westwood
Franklin	Norfolk	Weymouth
Gloucester	North Reading	Wilmington
Hamilton	Norwell	Winchester
Hanover	Norwood	Winthrop
Hingham	Peabody	Woburn
Holbrook	Pembroke	Wrentham
Holliston	Quincy	

CAPE COD**(15 Communities)**

Barnstable	Eastham	Provincetown
Bourne	Falmouth	Sandwich
Brewster	Harwich	Truro
Chatham	Mashpee	Wellfleet
Dennis	Orleans	Yarmouth

CENTRAL MASSACHUSETTS**(40 Communities)**

Auburn	Leicester	Shrewsbury
Barre	Mendon	Southbridge
Berlin	Millbury	Spencer
Blackstone	Millville	Sturbridge
Boylston	New Braintree	Sutton
Brookfield	Nothborough	Upton
Charlton	Northbridge	Uxbridge
Douglas	North Brookfield	Warren
Dudley	Oakham	Webster
East Brookfield	Oxford	Westborough
Grafton	Paxton	West Boylston
Hardwick	Princeton	West Brookfield
Holden	Rutland	Worcester
Hopedale		

FRANKLIN COUNTY

(26 Communities)

Ashfield	Greenfield	Orange
Bernardston	Hawley	Rowe
Buckland	Heath	Shelburne
Charlemont	Leverett	Shutesbury
Colrain	Leyden	Sunderland
Conway	Monroe	Warwick
Deerfield	Montague	Wendell
Erving	New Salem	Whately
Gill	Northfield	

MARTHA'S VINEYARD

(7 Communities)

Chilmark	Gosnold	West Tisbury
Edgartown	Oak Bluffs	
Gay Head	Tisbury	

MERRIMACK VALLEY

(15 Communities)

Amesbury	Haverhill	Newburyport
Andover	Lawrence	North Andover
Boxford	Merrimac	Rowley
Georgetown	Methuen	Salisbury
Groveland	Newbury	West Newbury

MONTACHUSETT

(22 Communities)

Ashburnham	Harvard	Shirley
Ashby	Hubbardston	Sterling
Athol	Lancaster	Templeton
Ayer	Leominster	Townsend
Clinton	Lunenburg	Westminster
Fitchburg	Petersham	Winchendon
Gardner	Phillipston	
Groton	Royalston	

NANTUCKET

(1 Community)
Nantucket

NORTHERN MIDDLESEX

(9 Communities)

Billerica	Dunstable	Tewksbury
Chelmsford	Lowell	Tyngsborough
Dracut	Pepperell	Westford

OLD COLONY

(15 Communities)

Abington	Easton	Plymouth
Avon	Halifax	Plympton
Bridgewater	Hanson	Stoughton
Brockton	Kingston	West Bridgewater
East Bridgewater	Pembroke	Whitman

PIONEER VALLEY

(43 Communities)

Agawam	Hampden	South Hadley
Amherst	Hatfield	Southampton
Belchertown	Holland	Southwick
Blandford	Holyoke	Springfield
Brimfield	Huntington	Tolland
Chester	Longmeadow	Wales
Chesterfield	Ludlow	Ware
Chicopee	Middlefield	Westfield
Cummington	Monson	Westhampton
East Longmeadow	Montgomery	West Springfield
Easthampton	Northampton	Wilbraham
Goshen	Palmer	Williamsburg
Granby	Pelham	Worthington
Granville	Plainfield	
Hadley	Russell	

SOUTHEASTERN MASSACHUSETTS

(27 Communities)

Acushnet	Lakeville	Raynham
Attleboro	Mansfield	Rehobeth
Berkley	Marion	Rochester
Carver	Mattapoisett	Seekonk
Dartmouth	Middleborough	Somerset
Dighton	New Bedford	Swansea
Fairhaven	North Attleboro	Taunton
Fall River	Norton	Wareham
Freetown	Plainville	Westport

APPENDIX C

TRANSIT AUTHORITY MEMBER COMMUNITIES

BERKSHIRE REGIONAL TRANSIT AUTHORITY

Adams	Hinsdale	Pittsfield
Cheshire	Lanesborough	Richmond
Clarksburg	Lee	Stockbridge
Dalton	Lenox	Williamstown
Great Barrington	North Adams	

BROCKTON AREA TRANSIT AUTHORITY

Abington	Brockton	Stoughton
Avon	East Bridgewater	West Bridgewater
Bridgewater	Easton	Whitman

CAPE ANN TRANSIT AUTHORITY

Essex	Ipswich	Rockport
Gloucester		

CAPE COD REGIONAL TRANSIT AUTHORITY

Barnstable	Eastham	Provincetown
Bourne	Falmouth	Sandwich
Brewster	Harwich	Truro
Chatham	Mashpee	Wellfleet
Dennis	Orleans	Yarmouth

FRANKLIN REGIONAL TRANSIT AUTHORITY

Ashfield	Goshen	Phillipston
Athol	Greenfield	Plainfield
Bernardston	Hawley	Rowe
Buckland	Heath	Russell
Charlemont	Huntington	Shelburne
Chesterfield	Middlefield	Shutesbury
Colrain	Montague	Southampton
Conway	Montgomery	Southwick
Cummington	New Salem	Warwick
Deerfield	Northfield	Wendell
Erving	Orange	Westhampton
Gill	Petersham	Whately
		Worthington

GREENFIELD-MONTAGUE TRANSPORTATION AREA

Greenfield

Montague

GREATER ATTLEBORO-TAUNTON REGIONAL TRANSIT AUTHORITY

Attleboro

Mansfield

Plymouth

Carver

Middleboro

Raynham

Dighton

North Attleboro

Rehoboth

Kingston

Norton

Seekonk

Lakeville

Plainville

Taunton

Wareham

LOWELL REGIONAL TRANSIT AUTHORITY

Acton

Groton

Townsend

Billerica

Lowell

Tyngsborough

Chelmsford

Pepperell

Westford

Dracut

Tewksbury

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

Arlington

Lincoln

Revere

Ashland

Lynn

Rockland

Bedford

Lynnfield

Salem

Belmont

Malden

Saugus

Beverly

Manchester

Scituate

Boston

Marblehead

Sharon

Braintree

Marshfield

Sherborn

Brookline

Medfield

Somerville

Burlington

Medford

Stoneham

Cambridge

Melrose

Sudbury

Canton

Middletown

Swampscott

Chelsea

Millis

Topsfield

Cohasset

Milton

Wakefield

Concord

Nahant

Walpole

Danvers

Natick

Waltham

Dedham

Needham

Watertown

Dover

Newton

Wayland

Duxbury

Norfolk

Wellesley

Everett

North Reading

Wenham

Framingham

Norwell

Weston

Hamilton

Norwood

Westwood

Hanover

Peabody

Weymouth

Hingham

Pembroke

Wilmington

Holbrook

Quincy

Winchester

Hull

Randolph

Winthrop

Lexington

Reading

Woburn

MERRIMACK VALLEY REGIONAL TRANSIT AUTHORITY

Amesbury	Haverhill	Newburyport
Andover	Lawrence	North Andover
Boxford	Methuen	Rowley
Georgetown	Merrimac	West Newbury
Groveland	Newbury	

MONTACHUSETT REGIONAL TRANSIT AUTHORITY

Ashburnham	Hubardston	Shirley
Ashby	Lancaster	Sterling
Ayer	Leominster	Templeton
Fitchburg	Littleton	Westminster
Gardner	Lunenburg	Winchendon
Hardwick	Royalston	

PIONEER VALLEY TRANSIT AUTHORITY

Agawam	Hampden	Springfield
Amherst	Holyoke	Sunderland
Belchertown	Leverett	Ware
Chicopee	Longmeadow	Westfield
Easthampton	Ludlow	West Springfield
East Longmeadow	Northampton	Wilbraham
Granby	Pelham	Williamsburg
Hadley	South Hadley	

SOUTHEASTERN REGIONAL TRANSIT AUTHORITY

Acushnet	Freetown	Somerset
Dartmouth	Mattapoissett	Swansea
Fairhaven	New Bedford	Westport
Fall River		

MARTHA'S VINEYARD TRANSIT AUTHORITY

Chilmark	Gay Head	Tisbury
Edgartown	Oak Bluffs	West Tisbury

WORCESTER REGIONAL TRANSIT AUTHORITY

Auburn	Holden	Southborough
Barre	Holland	Southbridge
Berlin	Leicester	Spencer
Boylston	Marlborough	Sturbridge
Brimfield	Millbury	Sutton
Brookfield	North Brookfield	Wales
Charlton	Northborough	Warren
Clinton	Oakham	Webster
Douglas	Oxford	Westborough
Dudley	Princeton	West Boylston
East Brookfield	Rutland	West Brookfield
Grafton	Shrewsbury	Worcester

APPENDIX D

PUBLIC PARTICIPATION FOR ACCESSING THE FUTURE

Accessing The Future is the result of a proactive public participation process which was integrally tied to the ongoing efforts of the thirteen planning regions of the Commonwealth. Implementation of the public participation process, as well as overall development of *Accessing the Future*, was the responsibility of the Executive Office of Transportation and Construction's Bureau of Transportation Planning and Development (BTPD), with oversight and guidance provided by an Executive Steering Committee. This Committee, responsible for policy direction, oversight, and resource allocation was comprised of high-level representatives of the following agencies:

- Federal Highway Administration
- Federal Transit Administration
- Executive Office of Environmental Affairs
- Executive Office of Economic Affairs
- Executive Office of Transportation and Construction
- Governor's Highway Safety Bureau
- Massachusetts Highway Department
- Massachusetts Bay Transportation Authority
- Massachusetts Aeronautics Commission
- Massachusetts Port Authority
- Massachusetts Turnpike Authority
- Massachusetts Association of Regional Planning Agencies
- Massachusetts Association of Regional Transit Authorities

BTPD, under the direction of the Executive Steering Committee, implemented a public participation program designed to ensure that all interested citizens were informed and involved in guiding Plan development. Through a public outreach program, participation was sought from public agencies, private citizens, interest groups, cities and towns, and the business community.

PUBLIC OUTREACH PROCESS

The public participation program relied on a variety of outreach methods to initiate public dialogue regarding the Plan. These methods included publishing of public notices in local and major newspapers, the mailing of newsletters to an extensive mailing list, and the presentation of the draft Plan at public meetings in each planning region.

Publication of Public Participation Plan

BTPD contracted with the consulting firm of Howard/Stein-Hudson Associates to assist in the development of the Plan's public participation process. The proposed public involvement procedures for the Plan were published on April 27, 1994 (Table D-1 presents a list of the

Table D-1
Public Participation Plan Publication Dates

REGIONAL PLANNING AGENCY	NEWSPAPER	DATE PUBLISHED
Berkshire County Regional Planning Commission	The Berkshire Eagle	April 27, 1994
Cape Cod Commission	Cape Cod Times	April 29, 1994
Central Massachusetts Regional Planning Commission	Worcester Telegram and Gazette	April 27, 1994
Franklin County Planning Department	Springfield Union News	April 27, 1994
Martha's Vineyard Commission	Martha's Vineyard Times	April 28, 1994
Merrimack Valley Planning Commission	The Eagle-Tribune (Lawrence)	April 27, 1994
Metropolitan Area Planning Council	The Boston Globe Boston Herald	April 27, 1994 April 27, 1994
Montachusett Regional Planning Commission	Sentinel and Enterprise Fitchburg / Leominster	April 27, 1994
Nantucket Planning and Economic Development Commission	The Inquirer and Mirror	April 28, 1994
Northern Middlesex Council of Governments	The Sun Chronicle (Lowell)	April 27, 1994
Old Colony Planning Council	Brockton Enterprise	April 27, 1994
Pioneer Valley Planning Commission	Springfield Union News	April 27, 1994
Southeastern Regional Planning and Economic Development District	Attleboro Sun Chronicle Fall River Herald News New Bedford Standard Times The Taunton Daily Gazette	April 27, 1994 April 27, 1994 April 27, 1994 April 27, 1994

newspapers, and dates of publication). The purpose of the public notice was to announce the proposed public involvement process and to solicit comments on the process as outlined. The public involvement procedures presented were based on the long-established public involvement process of the Commonwealth's regional planning agencies (RPAs) and the components of the U.S. Department of Transportation's Statewide and Metropolitan Planning Rules related to public involvement (23 CFR Part 450, October 28, 1993).

Publications for Fostering Public Involvement

Approximately 4,700 names of individuals and organizations were compiled into a regularly updated mailing list, primarily assembled from mailing lists of the RPAs, as well as those of other organizations. A process was created to ensure that any additions or alterations to the mailing list were made promptly. The first mailing consisted of a brochure (Exhibit D-1) which defined the statewide transportation plan, who was responsible for completing it, and how the public could get involved in its development. To facilitate citizen involvement in the Plan, a map showing the boundaries of the RPAs, with contact names, was included. This brochure was also made available through the RPAs.

A series of newsletters were distributed to provide up-to-date information about the development of the draft Plan, as well as topics of interest from the Plan itself. Public comment on these aspects or on any other part of the draft Plan were obtained through a tear-off pre-paid mailer at the bottom of each newsletter. The mailer contained a general question pertaining to the topic of the newsletter and space for comments and/or requests for portions of the draft Plan as they were available. Eight newsletters (shown in Exhibit D-2) were created and mailed to the approximately 4,700 addresses on the mailing list. The titles of the newsletters were as follows:

1. Public Involvement in *Accessing the Future*, July 25, 1994
2. Policies and Initiatives, August 12, 1994
3. Transportation System Usage, Transportation System Usage, September 1, 1994
4. Schedule of Regional Presentations, September 12, 1994
5. Bicycle and Pedestrian Issues, September 23, 1994
6. Management and Monitoring Systems, October 7, 1994
7. Environmental Quality & Transportation, November 15, 1994
8. Intelligent Transportation Systems, November 28, 1994

The first complete draft of the policies goals and objectives chapter (Chapter 2) was made available on June 21, 1994 and was widely circulated. Subsequent versions of the policies and initiatives were made available approximately every six weeks until the draft Plan was ready in early October 1994. During October and November over 600 copies of the draft Plan were distributed to interested parties.

Distribution of Draft Plan

All materials pertaining to the Plan were made available through BTPD, the RPAs, other transportation agency offices throughout the Commonwealth, selected local libraries, and the State Transportation Library. And, because it is the policy of the Executive Office of Transportation and Construction to ensure that all requests for materials in accessible formats be honored, *Accessing the Future* was available in large print, audio tape, computer disk, and on the Massachusetts Coalition for the Blind computer bulletin board.

Regional Presentations of Draft Plan

Twelve presentations of the draft Plan, coordinated by BTPD and the RPAs, were made throughout the Commonwealth during October 1994. The regional presentations of the draft Plan were publicized through advertisements in local papers, announcements at RPA meetings, and through newsletter number four. RPA staff members made follow-up telephone calls to interested citizens to remind them of the presentations. A sample legal notice is included as Exhibit D-3.

The regional presentations were the major means of reaching out to a broad cross-section of organizations and individuals to inform them of *Accessing the Future* and to solicit their input. At the twelve regional presentations a summary of the draft Plan was presented with elements tailored specifically to the host region.

Each regional presentation covered a wide range of information to appeal to people with an extensive understanding of transportation planning in their regions and to those not previously involved in the transportation planning process. The Director of BTPD, with the assistance of BTPD staff, made each slide show presentation followed by a question and answer session.

The slide show portion of the presentations included eighty slides on two carousels, designed to take approximately 30 minutes. The length of the entire presentation ranged from one to two hours depending on the length of the question and answer period. All regional meetings were held in the evening in buildings meeting all the federally established accessibility requirements. A list of the dates and locations of the presentations is attached as Table D-2.

FEEDBACK ON THE PLAN

The goal of the public participation program was to inform people of transportation planning issues and also to receive public input to ensure that *Accessing the Future* was truly a consensus document. The methods described below were used to get direct input from the public.

Fact Sheet Comment Cards

In response to the eight newsletters that were distributed, BTPD received approximately 500 comments on the pre-paid mailer. In addition, many organizations, including the RPAs, chose to write detailed letters regarding comments on the draft Plan. All comments and suggestions were transmitted prompt responses acknowledging the authors' time and effort, and thanking them for participating in the process. The issues detailed in the letters and comment cards were subsequently reviewed by BTPD for possible alteration of and/or inclusion in the final version of the Plan.

Feedback at the Regional Presentations

The slide shows, designed to summarize the Plan and to generate discussion in each of the regions, were generally well attended, with an average attendance of 28 persons. Minutes were taken at each presentation and BTPD staff recorded substantive comments for possible inclusion in the final document.

Table D-2
Schedule of Accessing the Future Regional Presentations

REGION	DATE (1994)	TIME	LOCATION
Montachusett Regional Planning Commission	Sept. 27	7:00 PM	1427 Water Street, Fitchburg
Franklin County Planning Department	Sept. 28	7:00 PM	Court House 425 Main Street, Greenfield
Pioneer Valley Planning Commission	Oct. 4	7:00 PM	Springfield City Hall, Springfield
Southeastern Regional Planning and Economic Development District	Oct. 5	7:00 PM	SRPEDD Offices 88 Broadway, Taunton
Metropolitan Area Planning Council	Oct. 12	3:30 PM	State Transportation Building, Boston
Cape Cod Commission	Oct. 12	6:30 PM	Dennis Senior Center East Dennis
Central Massachusetts Regional Planning Commission	Oct. 13	7:00 PM	20 Washington Square, Worcester
Northern Middlesex Council of Governments	Oct. 19	7:30 PM	Gallagher Terminal 115 Thorndike Street, Lowell
Berkshire County Regional Planning Commission	Oct. 20	7:30 PM	10 Fenn Street, Pittsfield
Old Colony Planning Council	Oct. 26	7:00 PM	70 School Street, Brockton
Merrimack Valley Planning Commission	Oct. 27	7:30 PM	160 Main Street, Haverhill
Executive Office of Transportation and Construction	Nov. 2	7:00 PM	State Transportation Building 10 Park Plaza, Boston

Comments from the regional presentations represented a broad range of concerns and interests. Many people commented on the current MPO process and the need for increased coordination and cooperation between state agencies and the MPOs. In almost every region there were questions and concerns about bikeway projects and a strong desire for increased funding and attention to bicycle and pedestrian needs. There were numerous funding questions, the most common either related to funding of the Central Artery/Third Harbor Tunnel or to general concerns about the process of distributing federal funds to the regions. In addition, there were several questions on implementation of the Americans with Disabilities Act, cooperation between states in the Northeast, and air quality conformity requirements. Many questions concerned the role *Accessing the Future* would have in guiding future transportation decisions.

Letters and Draft Plan

Numerous letters were received in response to the public presentations in the regions and to the draft Plan. These letters varied greatly, some requested that minor corrections be made to the Plan while others suggested more substantive changes.

Keeping Track of the Comments

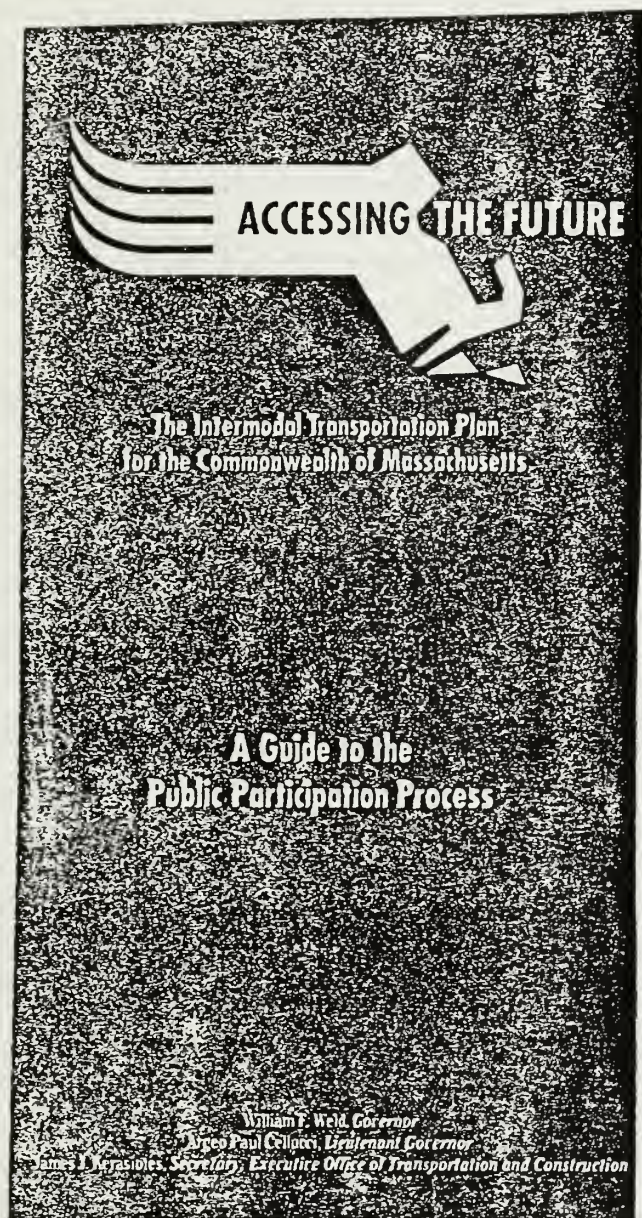
Documenting the comments received through letters, fact sheet mailers, and meetings was an essential component of the public participation process. Throughout the Plan's preparation comments were regularly received from the public. A process outlined in a flow chart (Exhibit D-4) was created to assure that comment cards and letters were addressed promptly and appropriate action was taken. A detailed spreadsheet was also kept to ensure that all comments were responded to appropriately. This spreadsheet listed a sequential number which had been assigned to each card and letter, along with the name and address of the sender and the basic subject area discussed. A log was also kept to record requests for draft Plans and other information. The log is indexed by region and is available to the public at the State Transportation Library.

FINAL PLAN PRESENTATION

The draft Plan was submitted to the FHWA and the FTA on December 30, 1994. A final document which includes consideration of all public comments was submitted in late Spring, 1995. Although this date marks the completion of *Accessing the Future*, public involvement in the transportation planning process is ongoing.

This public participation process marked the first time in recent years that the Commonwealth's transportation agencies have conducted a broad public outreach process for a statewide policy plan. The goal was to create an iterative planning process that gave both transportation providers and users an understanding of current and future transportation policy. Citizens are encouraged to remain involved in transportation planning because, through this open process, the Commonwealth can better access our transportation future.

Exhibit D-1 Public Participation Brochure



What is ACCESSING THE FUTURE?

ACCESSING THE FUTURE is the long-range transportation plan for Massachusetts. Rather than a document that outlines every transit project, roadway segment, or bridge improvement, the Plan will identify policies, goals, and initiatives to help the Commonwealth plan for the future of its multimodal and intermodal transportation network and guide infrastructure investment decisions into the 21st century.

The policies outlined in the Plan will be used to foster the relationship between transportation facilities and economic development and to address the needs of passenger transport and freight movement, among other key issues.

ACCESSING THE FUTURE is integrally tied to ongoing local long-range planning efforts and will be coordinated with the existing transportation plans in each of the thirteen regions of the Commonwealth.

Who is responsible for preparing ACCESSING THE FUTURE?

The Executive Office of Transportation and Construction (EOTC) is the cabinet-level transportation agency that provides policy direction for the Massachusetts Highway Department, the Massachusetts Aeronautics Commission, the Massachusetts Bay Transportation Authority, the Massachusetts Port Authority, and the Massachusetts Turnpike Authority. EOTC has designated its Bureau of Transportation Planning and Development (BTP&D) with the responsibility for the coordination and production of the Plan.

The purpose of the Plan is to shape a balanced transportation policy for the Commonwealth for the next 25 years. Its development involves not only state transportation agencies, but also other state agencies in areas such as economic and community development, environmental affairs, energy, and public safety. Recognizing the importance of local involvement, these state agencies will be assisted by the Massachusetts Association of Regional Planning Agencies and the Massachusetts Association of Regional Transit Authorities.

Why is this Plan being prepared?

The passage of the federal Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 mandates that each state have a long-range Statewide Transportation Plan to guide the maintenance and improvement of its surface transportation network. While transportation planning is not new to Massachusetts, ISTEA calls upon us to develop a long-range plan which takes into consideration traditional transportation concerns as well as other factors that affect, or are affected by, transportation decisions. To meet that mandate, **ACCESSING THE FUTURE** will address energy consumption, air quality benefits, social benefits, and fiscal implications, among other issues.

Exhibit D-1 (continued) Public Participation Brochure

The intent of **ACCESSING THE FUTURE** is to engage participants in the development of policies such that subsequent projects, shown to be consistent with the Plan, receive the support essential for successful implementation.

Why is your input important?

ISTEA re-emphasizes the need for consensus-building on transportation issues and decision-making. This objective can only be achieved through an effective public participation process.

The participation of citizens, representatives of organizations, agencies, cities and towns, and the business community is critical to this process. Your comments on proposed policies as well as on information gathered on existing conditions and future trends are important and, therefore, are strongly encouraged.

Among the questions to be addressed where your comments will be most valuable are:

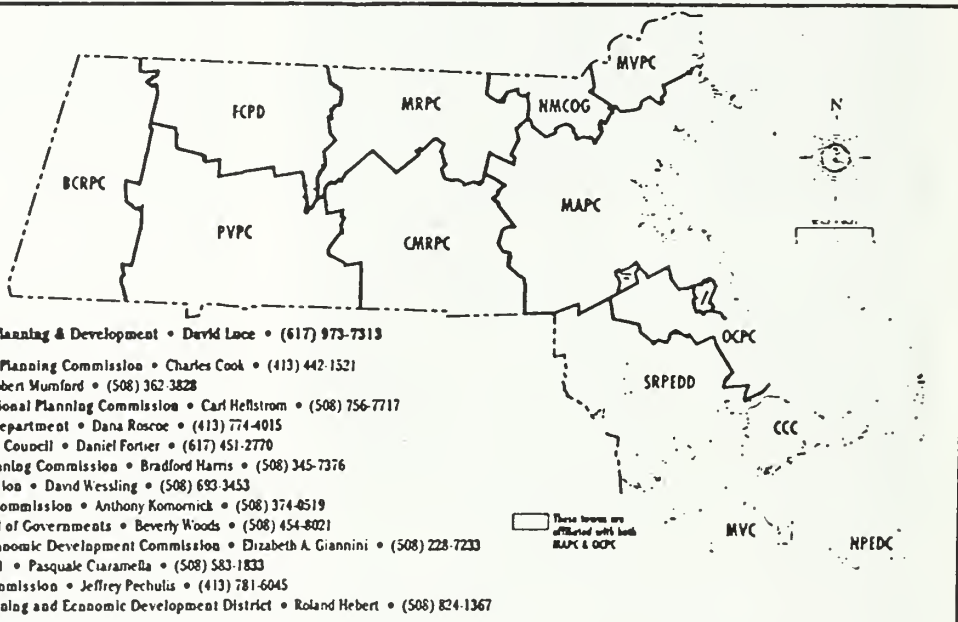
- How can we improve the transportation planning process?
- What is the best way to preserve and maintain our existing transportation network?

- What will make our transportation system safer?
- How can the transportation system be made more efficient?
- How can we ensure accessibility for all users?
- What strategies can we use to promote economic development through transportation policy?
- How can we foster environmental sensitivity, support thoughtful land use, and improve the quality of life through transportation policy?
- What are the best ways to ensure that transportation decision-making leads to cost-effective, affordable projects and programs?

How do you participate in the process?

- Make sure you are on the mailing list of your regional planning agency.
- Attend *open* transportation advisory group meetings in your region.
- Call or write your regional contact person with comments or suggestions.
- Read fact sheets and progress bulletins that will be sent periodically.
- Attend meetings to review the Draft Plan in October 1994.
- Attend a public presentation of the Final Plan in January 1995.

To get more information or to get on a mailing list, contact the individuals below:



STP&D	Bureau of Transportation Planning & Development • David Luce • (617) 973-7313
BCRPC	Berkshire County Regional Planning Commission • Charles Cook • (413) 442-1521
CCC	Cape Cod Commission • Robert Mumford • (508) 362-3828
CMRPC	Central Massachusetts Regional Planning Commission • Carl Hellstrom • (508) 756-7717
FCPD	Franklin County Planning Department • Dana Roscoe • (413) 774-4015
MAPC	Metropolitan Area Planning Council • Daniel Fortier • (617) 451-2770
MRPC	Montachusett Regional Planning Commission • Bradford Harris • (508) 345-7376
MVC	Martha's Vineyard Commission • David Wessling • (508) 693-3453
MVPC	Merrimack Valley Planning Commission • Anthony Komornick • (508) 374-4519
NMCOC	Northern Middlesex Council of Governments • Beverly Woods • (508) 454-8021
NPEDC	Nantucket Planning and Economic Development Commission • Elizabeth A. Giannini • (508) 228-7233
OCP	Old Colony Planning Council • Pasquale Ciaramella • (508) 583-1833
PVPC	Pioneer Valley Planning Commission • Jeffrey Pechulis • (413) 781-6045
SRPEDD	Southeastern Regional Planning and Economic Development District • Roland Hebert • (508) 824-1367

May 1994


Exhibit D-1 (continued) Public Participation Brochure

Message from the Secretary of Transportation

Passage of the Intermodal Surface Transportation Efficiency Act and the Clean Air Act Amendments of 1990 requires today's transportation manager to develop a transportation system which is intermodal in nature and sensitive to environmental concerns. The resources necessary to develop such a transportation system are, however, limited. Ultimately in managing the business of transportation, we must ensure that we are efficiently allocating these resources for the planning, design, and construction of intermodal transportation projects which improve air quality and advance economic growth.

Meeting all these objectives successfully will require more than just the concentrated efforts of the Commonwealth's transportation agencies. It will also require the coordinated efforts of both the public and private sectors. By working together, the state, our business community, and our private citizens can manage change, attain clean air goals, and maximize our transportation investment.

I urge you to get involved and express your ideas, concerns, and desires. It is imperative that **ACCESSING THE FUTURE** be a product of our common effort and common sense, one that will guide us well into the next century.


James J. Kerasiotes, Secretary
Executive Office of Transportation and
Construction

Schedule

The Bureau of Transportation Planning & Development (BTP&D), as the Plan's coordinating agency, will be providing fact sheets and progress bulletins throughout the preparation of the Plan. State transportation officials will discuss the Plan's progress at regional transportation group meetings. The Draft Plan will be presented in the fall for public review and comment in each of the thirteen regions of the Commonwealth.

A final presentation of **ACCESSING THE FUTURE** will be made in January 1995 prior to its official submittal to the U.S. Department of Transportation (US DOT).

May - October 1994	Regional Planning Agency Transportation Group Meetings
September - October	Regional Presentations of Draft Plan
January 1995	Public Presentation of Final Plan Submission to US DOT

Exhibit D-2

Newsletter 1: Public Involvement in *Accessing the Future*, July 25, 1994

The Intermodal Transportation Plan for the Commonwealth of Massachusetts

Executive Office of Transportation and Construction • Bureau of Transportation Planning and Development
10 Park Plaza, Suite 4150 • Boston, Massachusetts 02116-3969 • (617) 973-7313

July 25, 1994

Public Involvement Needed in Accessing the Future

The Intermodal Surface Transportation Efficiency Act of 1991 - known as "ISTEA" - provides the Commonwealth of Massachusetts with more than \$5 billion from the Federal Government for transportation investments. The funding is invested in transit, bridges, highways, bikeways, preservation of wetlands, and transportation enhancements (including rail trails, scenic easements, and historic preservation). To ensure thoughtful planning of these investments, ISTEA requires each state to develop a long-range, statewide transportation plan that

considers and integrates local and regional transportation planning efforts. This comprehensive approach to transportation planning creates a more significant role for local and regional government in determining where public funds are spent on transportation. The purpose of this bulletin is to describe the means and opportunities for public involvement - YOUR involvement - in the development and review of the statewide transportation plan, the Commonwealth's key to Accessing the Future.

The Process

The Executive Office of Transportation and Construction (EOTC), with its Bureau of Transportation Planning and Development (BTP&D), is the lead coordinating agency for Accessing the Future, the Intermodal Transportation Plan for the Commonwealth of Massachusetts. As lead agency, EOTC/BTP&D published proposed public involvement procedures for public comment on April 27, 1994. The procedures are based on the well-established public involvement process of the Metropolitan Planning Organizations (MPO) of the Commonwealth. The MPOs are the transportation policy bodies established for each of the Commonwealth's 13 regions. MPO membership consists of the regional planning agency, the regional transit authority, the Massachusetts Highway Department and the Executive Office of Transportation and Construction (the Boston MPO also includes Massport and the MBTA Advisory Board).

Following a 45-day comment period, the procedures provided below were adopted: Using the MPOs as a conduit for public information and involvement, the (public participation) process consists of presentations and discussions at regional transportation advisory group meetings, the mailing of brochures, newsletters, and fact sheets to city and town elected officials, transportation agencies, private transportation providers and individuals. Press releases will be made periodically to announce progress of the Plan and meetings will be held to discuss its development. The Draft Plan will be presented in each MPO region in early fall 1994, and a presentation of the Final Plan will take place in January 1995.

The Goal

The public involvement process is designed to provide:

- Early and continuing opportunities for public involvement
- Timely dissemination of information about transportation plans and programs
- Reasonable public access to technical and policy information
- Adequate public notice on public involvement activities
- Opportunities for public review and comment at key decision points
- Identification and consideration of the needs of those traditionally under-served by the transportation system
- Documentation of all comments submitted
- Periodic review and revision of the public involvement process

Your Input

Early involvement of citizens, organizations, agencies, cities and towns, and the business community is critical to the development of Accessing the Future. Input on the following policy areas is sought: Integrated and Cooperative Planning Process, Infrastructure Preservation, System Safety, Mobility for People and Goods, System Access, Economic Development Issues, Environment, Land Use and Quality of Life, and Cost Effectiveness and Financing.

A draft of these policies, dated June 21, 1994, is in circulation for public review and comment.

Exhibit D-2
Newsletter 2: Policies and Initiatives, August 12, 1994



The Intermodal Transportation Plan for the Commonwealth of Massachusetts

Executive Office of Transportation and Construction • Bureau of Transportation Planning and Development
10 Park Plaza, Suite 4150 • Boston, Massachusetts 02116-3969 • (617) 973-7313

August 12, 1994

Policies and Initiatives in Accessing the Future

Accessing the Future is the intermodal transportation plan currently being developed for the Commonwealth of Massachusetts. The Plan will identify policies and initiatives to help guide the future of our multimodal and intermodal transportation network. It will provide a framework for our future transportation infrastructure investment decisions into the 21st century.

Sections of the Plan will be made available for review as they are prepared, and a complete draft will be made available for review and comment in September 1994.

The section of Accessing the Future entitled *Policies and Initiatives* is now available for public review. This is a product of an executive steering committee that is comprised of various transportation, economic, and environmental agencies responsible for reviewing transportation policy.

The *Policies and Initiatives* section of the plan includes eight policy areas for which policy statements and program-specific initiatives are being generated. They are:

- *Integrated and cooperative planning process*
The Massachusetts transportation system shall be the product of an integrated and cooperative planning process that provides extensive opportunities for public participation.
- *Infrastructure preservation*
The state's transportation system represents an irreplaceable asset that must be maintained by utilizing resources in the most efficient and effective manner.
- *Transportation system safety*
The safety of the users shall be a primary consideration in the design, development, and operation of the Massachusetts transportation system.
- *Mobility for people and goods*
The main purpose of the state's transportation system is to provide mobility for people and goods, to improve quality

of life, and to provide economic advantages. Mobility improvements may be derived from optimizing the operation of existing systems and by encouraging the use of alternative modes.

- *Transportation system access*
Ensure that physical limitations do not impede personal mobility, modal choice, and economic vitality; and that the Americans with Disabilities Act of 1990 is fully implemented.
- *Economic development*
The state's transportation system shall serve as a stimulus that enhances the state's competitive advantage, promotes economic development, and maximizes employment opportunities.
- *Environment, land use and quality of life*
The Massachusetts transportation system shall be consistent with the concept of a sustainable society, one in which economic growth and environmental protection work in tandem, where every resident's quality of life is maintained and our historic and scenic values are preserved.
- *Cost effectiveness and financing*
In a time of extensive needs but limited resources, it is essential that transportation services be delivered in the most cost-effective and efficient manner, and that innovative financing strategies be used to the maximum extent.

If you already have a copy of the draft *Policies and Initiatives*, please take the time to review it and send us your comments using the attached pre-paid mailer. Your input will help us to prepare the best possible long-range transportation plan for the Commonwealth, our key to Accessing the Future. To receive a copy of the draft *Policies and Initiatives*, please mail the attached form or call the Bureau of Transportation Planning & Development at (617) 973-7313.

Exhibit D-2

Newsletter 3: Transportation System Usage, Transportation System Usage, September 1, 1994



The Intermodal Transportation Plan for the Commonwealth of Massachusetts

Executive Office of Transportation and Construction • Bureau of Transportation Planning and Development
10 Park Plaza, Suite 4150 • Boston, Massachusetts 02116-3969 • (617) 973-7313

September 1, 1994

Transportation System Usage

The Commonwealth of Massachusetts has an extensive intermodal transportation system. Its highways are among the safest in the country. The nation's oldest subway system is located here and transit usage is above the national average. Extensive intercity rail, bus and ferry service is available as well. A growing network of bicycle routes provides the public with even more travel options.

Travel patterns and trends in Massachusetts are similar to what is happening in the rest of the country. Person trips have increased at a rate that is higher than population increases. This is due in part to the dramatic influx of women into the work-force. While the state's population has increased by 6% over the last 20 years, households have increased by 27% during the same period. More and smaller households with higher rates of automobile ownership all contribute to increased person trips.

While the trend towards more and smaller households will continue, the rate of growth is expected to slow. The number of person trips will continue to rise as well, but at a slower pace. Population growth is expected to be fairly flat well into the next century. The problems we face, while serious, are manageable if we prepare for them now.

The average travel time per commute for all modes is 21 minutes. The trend towards longer commutes over greater distances continues. The percentage of people who drive alone increased from 61% in 1980, to 72% in 1990. The proportion of workers who use transit decreased from 9% to 8% during the same period, however, MBTA ridership increased by almost 20% over the last 10 years.

Twenty-nine percent (29%) of all trips are home-based work trips. Forty-seven percent (47%) are home-based other trips such as school, shopping, social and recreation. Twenty-four percent (24%) are non home-based such as leaving the office to attend a meeting and returning.

The increase in travel trips is placing increasing demands on the entire transportation system. To meet this challenge we must increase the efficiency of the existing system while making prudent investments in new transportation facilities. By integrating the modes we can make the existing system more efficient while expanding travel choices for the public.

ACCESSING THE FUTURE, The Intermodal Transportation Plan for the Commonwealth of Massachusetts is the blueprint which will guide us as we strive to meet these challenges. Your input is crucial to this effort.

How do Massachusetts' residents get to work?

Travel mode	Total Workers	Percentage
Drive alone	2,150,200	72.2%
Carpool	311,500	10.5%
Walk	161,800	5.4%
Transit	107,800	3.6%
Bus	103,000	3.5%
Work at home	74,800	2.5%
Commuter rail	28,500	1.0%
Bicycle	11,300	0.4%
Vanpool	6,500	0.2%
Taxi	6,200	0.2%
Ferry	1,900	0.1%
Other	11,800	0.4%
Total	2,975,300	100.0%

Source: 1990 U.S. census

Exhibit D-2

Newsletter 4: Schedule of Regional Presentations, September 12, 1994



The Intermodal Transportation Plan for the Commonwealth of Massachusetts

Executive Office of Transportation and Construction • Bureau of Transportation Planning and Development
10 Park Plaza, Suite 4150 • Boston, Massachusetts 02116-3969 • (617) 973-7313

September 12, 1994

Coming to a city or town near you: Accessing the Future

As part of the ongoing public participation process, the Executive Office of Transportation and Construction will be holding a series of public meetings to present the draft version of **ACCESSING THE FUTURE**, The Intermodal Transportation Plan for the Commonwealth of Massachusetts. Elements of the Plan will be presented in a slide show by the Bureau of Transportation Planning and Development. The meetings will be hosted by the Regional Planning Agencies across the State. A schedule of the meetings appears to the right.

Regional Planning and Accessing the Future

The Plan is the outgrowth of a comprehensive, cooperative and continuing regional transportation planning process. As such, it is appropriate that the draft Plan be presented to the public at a series of regional meetings. Please call the Regional Planning Agency hosting the meeting you wish to attend to confirm that the meeting is taking place as scheduled.

Your Input

The Intermodal Surface Transportation Efficiency Act of 1991 emphasizes the need for consensus-building on transportation issues and decision-making. The feedback generated by the public participation process will be an important consideration in the preparation of the final document. Your input is crucial to this process.

REGION	DATE	TIME	LOCATION
Montachusett Regional Planning Commission	Sept. 27, 1994	7:00 PM	1427 Water Street, Fitchburg, MA (508) 345-7376
Franklin County Planning Department	Sept. 28, 1994	7:00 PM	Court House 425 Main Street, Greenfield, MA (413) 774-4015
Pioneer Valley Planning Commission	Oct. 4, 1994	7:00 PM	Springfield City Hall, Room 218 (413) 781-6045
Southeastern Regional Planning & Economic Development District	Oct. 5, 1994	7:00 PM	88 Broadway, Taunton, MA (508) 824-1367
Metropolitan Area Planning Council	Oct. 12, 1994	3:30 PM	State Transportation Building 10 Park Plaza, Boston, MA (617) 451-2770
Cape Cod Commission	Oct. 12, 1994	6:30 PM	Dennis Senior Center 1045 Route 134, East Dennis (508) 362-3828
Central Massachusetts Regional Planning Commission	Oct. 13, 1994	7:00 PM	20 Washington Square, Suite 300 Worcester, MA (508) 756-7717
Northern Middlesex Council of Governments	Oct. 19, 1994	7:30 PM	Gallagher Terminal, Floor 3B 115 Thorndike Street, Lowell, MA (508) 454-8021
Berkshire County Regional Planning Commission	Oct. 20, 1994	7:30 PM	10 Fenn Street, Pittsfield, MA (413) 442-1521
Old Colony Planning Council	Oct. 26, 1994	7:00 PM	70 School Street, Brockton, MA (508) 583-1833
Merimack Valley Planning Commission	Oct. 27, 1994	7:30 PM	160 Main Street, Haverhill, MA (508) 374-0519
Executive Office of Transportation and Construction	Nov. 2, 1994	7:00 PM	State Transportation Building, 10 Park Plaza, Boston MA (617) 973-7313

Exhibit D-2
 Newsletter 5: Bicycle and Pedestrian Issues, September 23, 1994



The Intermodal Transportation Plan for the Commonwealth of Massachusetts

Executive Office of Transportation and Construction • Bureau of Transportation Planning and Development
 10 Park Plaza, Suite 4150 • Boston, Massachusetts 02116-3969 • (617) 973-7313

September 23, 1994

Bicycle and pedestrian issues

The Massachusetts transportation system includes not only motorized modes such as automobiles, trains, and watercraft, but also includes nonmotorized modes, specifically bicycling and walking.

Bicycling and walking are important components of **ACCESSING THE FUTURE**, The Intermodal Transportation Plan for the Commonwealth of Massachusetts. Bicycles are playing a larger role in the Commonwealth's transportation system. Greater numbers of people are bicycling for health benefits and because bicycling is simple, inexpensive, and energy efficient. Legislation such as the Intermodal Surface Transportation Efficiency Act (ISTEA) and the Clean Air Act Amendments (CAAA) has increased the importance of planning and design for bicyclists and pedestrians. **ACCESSING THE FUTURE** will combine bicycle and pedestrian initiatives from across Massachusetts into an integral

and comprehensive statement of policies and objectives.

In recent years, the Regional Planning Agencies (RPA) in Massachusetts have provided improvements for bicyclists and pedestrians. Such improvements include the Norwottuck Rail Trail which links Northampton Hadley Amherst, the Minuteman Commuter Bikeway in Arlington, Lexington and Bedford, the Cape Cod Rail Trail, bicycle parking at transit stations and extended hours for the "Bikes on the T" program. Guiding these improvements is the Bicycle and Pedestrian Program within the Commonwealth's Bureau of Transportation Planning and Development. This statewide program has responsibility for promoting and facilitating greater use of safe nonmotorized transportation and educating individuals and other agencies about the need for bicycle and pedestrian considerations in future transportation and land use planning.

Bicycling and walking in **ACCESSING THE FUTURE**

Massachusetts recognizes that bicyclists and pedestrians are a significant and growing component of the Commonwealth's transportation mix. In fact, according to the 1990 Census, walking is the third most popular means of home to work travel in Massachusetts. In addition to adding new off road facilities to the system, the Commonwealth is also advancing a number of initiatives to make it easier, safer, and more pleasurable for people to travel, by bicycle or on foot, on existing streets. The Draft Plan proposes a number of initiatives and specific objectives that would improve on street and off street conditions for bicyclists and pedestrians, and improve intermodal connectivity:

- Plan, promote, and provide safe travel for cyclists and pedestrians, recognizing that bicycling—and walking have distinct operational characteristics
- Adopt a statewide bicycle policy and a statewide pedestrian policy to promote safe bicycling and walking and develop separate statewide bicycle system and pedestrian system plans
- Make bicycle and pedestrian facilities an integral part of the highway system by designing, building, reconstructing, and maintaining roads and bridges to accommodate these modes
- Revise the MassHighway Department Design Manual to more fully incorporate state-of-the-practice bicycle and pedestrian elements
- Implement "traffic calming" programs that reduce motor vehicle speed and volume

- Develop a comprehensive off-street system of multi-use trails
- Provide safe and convenient ways to take bikes on buses, trains, ferries, and airplanes
- Plan, provide, and promote the needs of bicyclists and pedestrians through local, regional, and state land use policies such as site plan review, the state environmental review process, and others
- Include bicycle parking facilities as a parking management strategy
- Develop more bicycle and pedestrian facilities that support the Massachusetts tourism industry.

These are but a few of the initiatives the Commonwealth is supporting to promote bicycling and walking. The Bureau of Transportation Planning and Development in conjunction with the Regional Planning Agencies will soon be conducting a comprehensive study of all the bicycle and trail facilities in Massachusetts to help determine future needs. Call your RPA to become involved!

ACCESSING THE FUTURE builds on the bicycling and walking plans developed by the Regional Planning Agencies. This long range statewide plan will guide decision making concerning bicycle and pedestrian facilities and how to fully integrate them into the Massachusetts transportation system.

Exhibit D-2

Newsletter 6: Management and Monitoring Systems, October 7, 1994



The Intermodal Transportation Plan for the Commonwealth of Massachusetts

Executive Office of Transportation and Construction • Bureau of Transportation Planning and Development
10 Park Plaza, Suite 4150 • Boston, Massachusetts 02116-3969 • (617) 973-7313

Management Systems

October 7, 1994

Chapter 9 of *Accessing the Future*, The Intermodal Transportation Plan for the Commonwealth of Massachusetts focuses on Management Systems. The Intermodal Surface Transportation Efficiency Act (ISTEA) requires states to implement seven Management and Monitoring Systems. According to the Federal Management and Monitoring Systems Interim Final Rules, a management system is defined as: "... a systematic process, designed to assist decision makers in selecting cost-effective strategies / actions to improve the efficiency and safety of, and protect the investment in the nation's infrastructure. A management system includes: (1) identification of performance measures; (2) data collection and analysis; (3) determination of needs; (4) evaluation and selection of appropriate strategies / actions to address the needs; and (5) evaluation of the effectiveness of the implemented strategies / actions."

The seven systems required by ISTEA are:

Pavement Management System: A systematic process that provides, analyzes and summarizes pavement information for use in selecting and implementing cost-effective pavement construction, rehabilitation and maintenance programs for all Federal-aid highways.

Bridge Management System: A decision support tool that supplies analyses and summaries of data, uses mathematical models to make predictions and recommendations, and provides the means by which alternative policies and programs may be efficiently considered for all bridges, both on and off Federal-aid highways.

Safety Management System: A systematic process that has the goal of reducing the number and severity of traffic crashes on all public roads by providing information for selecting and implementing effective safety strategies and projects to ensure that all opportunities to improve highway safety are identified, considered and implemented in all phases of highway planning, design, construction, maintenance and operation. The Safety Management System shall incorporate roadway, human and vehicle safety elements.

Congestion Management System: A systematic process that provides information on transportation system performance and alternative strategies to alleviate congestion and enhance the mobility of people and goods. Strategies to be considered include TDM measures, HOV facilities and programs, public transportation capital and operating improvements, congestion

pricing, growth management strategies, incident management, IVHS technology and, as a last resort, additional general purpose capacity.

Public Transportation Facilities and Equipment Management System: A systematic process that collects and analyzes information on the condition and cost of transit assets, e.g., maintenance facilities, stations, terminals, transit-related structures, equipment, and rolling stock on a continuing basis in order to provide cost-effective strategies for providing and maintaining assets in serviceable condition. The Public Transportation Facilities and Equipment management system shall cover all public and private transit operators receiving Federal Transit Act Sections 3, 9, 16 or 18.

Intermodal Transportation Facilities and Systems Management System: A systematic process to identify and manage intermodal facilities that serve the movement of people and goods (the key linkages between one or more modes of transportation, where the performance or use of one mode will affect another) and to define strategies for improving their effectiveness. Intermodal facilities include highway elements providing terminal access, coastal and inland ports and canals, pipeline farms, airports, marine and/or rail terminals, major truck terminals, intercity bus terminals and major transit terminals.

Traffic Monitoring System for Highways: A systematic process for the collection, analysis, summary and retention of highway-related person and vehicular traffic data, including public transportation on public highways. These data include traffic volume, vehicle classification, vehicle weight and vehicle occupancy data associated with either a System of highways or a particular location, during a prescribed period of time.

Once implemented, these management systems will help the Regional Planning Agencies and State transportation agencies to prioritize project selection. By making repairs before major reconstruction is necessary, roads and bridges will be better maintained at greatly reduced cost. Well maintained roads, bridges and transit equipment will result in a safer transportation system. By monitoring traffic volume, congestion and accidents, planners will be able to direct safety and congestion mitigation projects to the areas where they are needed most.

Exhibit D-2

Newsletter 7: Environmental Quality & Transportation, November 15, 1994



The Intermodal Transportation Plan for the Commonwealth of Massachusetts

Executive Office of Transportation and Construction • Bureau of Transportation Planning and Development
10 Park Plaza, Suite 4150 • Boston, Massachusetts 02116-3969 • (617) 973-7313

Environmental Quality and Transportation

November 15, 1994

The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 ushered in a new era of transportation planning. In particular, it recognized a specific relationship between transportation and the natural environment. ISTEA requires that transportation planning consider environmental impacts from the outset and that the two be made to conflict as little as possible and to enhance each other when feasible.

CLEAN AIR

The Clean Air Act of 1970 formed the basis of the federal air pollution control program. Since then it has been amended numerous times, most recently in 1990. This law has profound implications for transportation policies, plans, programs and projects. The Commonwealth of Massachusetts is committed to meeting the National Ambient Air Quality Standards. It is the policy of the Commonwealth to:

- Prevent transportation policies and plans from conflicting with air quality improvement requirements.
- Ensure that transportation initiatives will serve to support air quality goals.
- Encourage travelers to utilize modes of transportation that produce the least pollution per passenger mile through incentives, new technology, and imaginative planning to achieve economic development goals and environmental objectives.

CLEAN WATER

It is the policy of the Commonwealth to:

- Be in full compliance with the federal Clean Water Act, the Coastal Zone Act Reauthorization Amendments of 1990, the Massachusetts Environmental Policy Act, the Massachusetts Wetlands Protection Act, Coastal Zone Management Consistency Review, and Chapter 91 of the Massachusetts General Laws in order to protect the state's water resources for values and uses important to the public interest, including wildlife and plant habitat protection, public and private water supplies, recreation, and a better quality of life.
- Minimize the impact of transportation projects on the

Commonwealth's water supply by avoiding impacts that affect water resources when feasible, minimizing impacts when they are unavoidable, and mitigating impacts when they occur.

- Promote new initiatives to reduce contamination of water resources and enhance wetland areas. These may include development of best management practices, improved designs for drainage work, wetlands replication and participation in efforts to establish a wetlands banking system.
- Protect coastal natural resources to enhance water quality and associated benefits such as restored shellfish beds.
- Continue to explore ways to reduce or limit the use of road salt without compromising public safety.
- Support a coordinated process for review and approval of proposed harbor and channel dredging activity.

LAND USE

It is the policy of the Commonwealth to:

- Strengthen the transportation infrastructure of established economic development centers.
- Site state facilities in locations served by existing infrastructure. Facilities that generate large numbers of trips should be located at sites accessible by various modes of transportation.
- Provide the widest feasible choice of transportation alternatives to encourage and support an environmentally sensitive pattern of land use.
- Insist that traffic mitigation measures in state environmental reviews and approvals support alternative travel modes such as: walking, bicycling, ridesharing and public transit.

ACCESSING THE FUTURE, The Intermodal Transportation Plan for the Commonwealth of Massachusetts outlines a comprehensive plan for environmentally sensitive transportation. In addition to the topics discussed above, the Plan also includes policies relating to: Hazardous Materials, Open Space, Historic Preservation, Scenic Byways, Energy Conservation and Noise Reduction.

Exhibit D-2

Newsletter 8: Intelligent Transportation Systems, November 28, 1994



The Intermodal Transportation Plan for the Commonwealth of Massachusetts

Executive Office of Transportation and Construction • Bureau of Transportation Planning and Development
10 Park Plaza, Suite 4150 • Boston, Massachusetts 02116-3969 • (617) 973-7313

Intelligent Transportation Systems

November 28, 1994

More efficient operation of transportation systems today and in the future will increasingly require the integration of computer, electronics and communications technologies to coordinate the activities of all modes of travel. This integration has been named intelligent transportation systems or ITS. The deployment of ITS will save: lives, time, money, energy and improve our quality of life. ITS technologies, integrated into future transportation plans will significantly improve the delivery of user services in areas such as: travel planning, traveler information, incident management, freight movement, emergency management, collision avoidance and in-vehicle navigation.

In order to achieve this integration, the Commonwealth of Massachusetts is moving forward with a policy that encourages and supports the application of advanced technologies where measurable gains may be realized to: improve safety; reduce congestion; enhance mobility; reduce environmental impacts; improve energy efficiency and improve economic efficiency. The intent of this policy is to utilize advanced technologies to enable coordinated decision making and shared information so that the transportation network, across all modes and through multiple agencies, functions and appears to the user as a single "seamless" system.

Products from the Intelligent Transportation Systems planning effort are already evident. Strategies for short- and long-range deployment of ITS elements were developed for eastern Massachusetts and presented in a report completed in January 1994 entitled *Intelligent Vehicle Highway Systems Strategic Deployment Plan For Metropolitan Boston*. Similar planning activities are beginning which will lead to the development of a statewide ITS strategic deployment plan. Regional and national ITS strategic planning initiatives are underway that includes participation in the I-95 Corridor Coalition, a cooperative effort of 13 states from Virginia to Maine; and the New England Transportation Initiative (NETI) which promotes cooperation among the six New England states.

Meanwhile, the state transportation agencies continue to move toward the deployment of advanced technologies

throughout the transportation system. Examples of this integration of technology with transportation management systems include planning and design of: detector, surveillance, monitoring, control and emergency management systems for the Central Artery/Third Harbor Tunnel; the testing of advanced traveler information systems such as *SmartTraveler* to provide real-time information for pre-trip and en-route user services and multi-agency cooperation for the development of electronic toll collection and toll management systems.

The Commonwealth of Massachusetts is moving forward to implement this policy through several initiatives:

- Develop a statewide strategic plan for the integration of advanced technologies into the transportation system.
- Establish an interagency, intermodal advanced technology coordinating committee under the auspices of the Executive Office of Transportation and Construction.
- Identify communication, data collection, data management, and data dissemination needs through the management systems process.
- Continue the strategic planning process initiated during the development of the Metropolitan Boston IVHS Strategic Plan.
- Establish criteria or measures of effectiveness to evaluate those technologies which should be incorporated into the transportation planning process through use of agency personnel, academic leaders and private sector experts.
- Educate, advise and inform transportation professionals on the benefits of incorporating advanced technologies in solutions to transportation problems.
- Actively participate in the deployment of advanced technologies through regional and national forums such as ITS America, the I-95 Corridor Coalition, and other associations.
- Explore alternative public/private partnering arrangements to fund advanced technology applications and system integration.

ACCESSING THE FUTURE, The Intermodal Transportation Plan for the Commonwealth of Massachusetts calls for the implementation of Intelligent Transportation Systems.

Exhibit D-2 Sample Newsletter Tear-off Postcards

Accessing the Future

Accessing the Future, the Intermodal Transportation Plan for the Commonwealth of Massachusetts, will identify policies, goals, objectives, and initiatives to help plan and guide transportation infrastructure investment into the 21st century. Input from the public will be important in developing the Draft Plan in the early fall. The Final Plan will be presented to the public in January 1995.

Please let us know your views regarding our efforts in developing Accessing the Future.

If you wish to receive a copy of the revised draft policies please send us your name and address

Accessing the Future

Transportation planning has a crucial role in the protection of environmental quality by assuring that policy makers and planners adhere to established guidelines and seek all appropriate ways to protect our natural resources. *ACCESSING THE FUTURE*, The Intermodal Transportation Plan for the Commonwealth of Massachusetts is the blueprint for a transportation system which promotes mobility and economic growth while protecting our environment. *ACCESSING THE FUTURE* is available in large print or on audio tape for the visually impaired. If you know of an individual or group that would benefit from this service please request it by returning the postpaid mailer with the name and address of the interested party. The comment period will end on Monday, November 28, 1994. If you wish to have your comments considered for the final document please submit them before this date. The final plan will be presented to the public in January 1995.

Accessing the Future

Accessing the Future, The Intermodal Transportation Plan for the Commonwealth of Massachusetts calls for the implementation of Management and Monitoring Systems. The technical support these systems will contribute to the transportation planning process will play a crucial role in our transportation future.

If you would like to receive additional information on Management Systems, or any other section of *Accessing the Future* please write your name, address and the information you wish to receive on the postpaid mailer and return it to us. The comment period will end on Monday, November 28, 1994. If you wish to have your comments considered for the final document please submit them before this date. The Final Plan will be presented to the public in January 1995.

Accessing the Future

The final version of *ACCESSING THE FUTURE* will be released in January 1995. The Plan is part of a transportation planning process that will be ongoing, continuous and inclusive. Public input is welcomed by the Regional Planning Agencies as well as the Commonwealth of Massachusetts at any time. If you have any questions or comments regarding ITS or on any other part of the Plan or the process by which it was developed, please use the postpaid mailer to forward them to us.

Exhibit D-3
Sample Regional Presentation Legal Notice



•• NOTICE ••
COMMONWEALTH OF
MASSACHUSETTS
EXECUTIVE OFFICE OF
TRANSPORTATION &
CONSTRUCTION

The Executive Office of Transportation & Construction will be conducting a public information meeting to present the draft version of

Accessing the Future, the Intermodal Transportation Plan for the Commonwealth of Massachusetts.

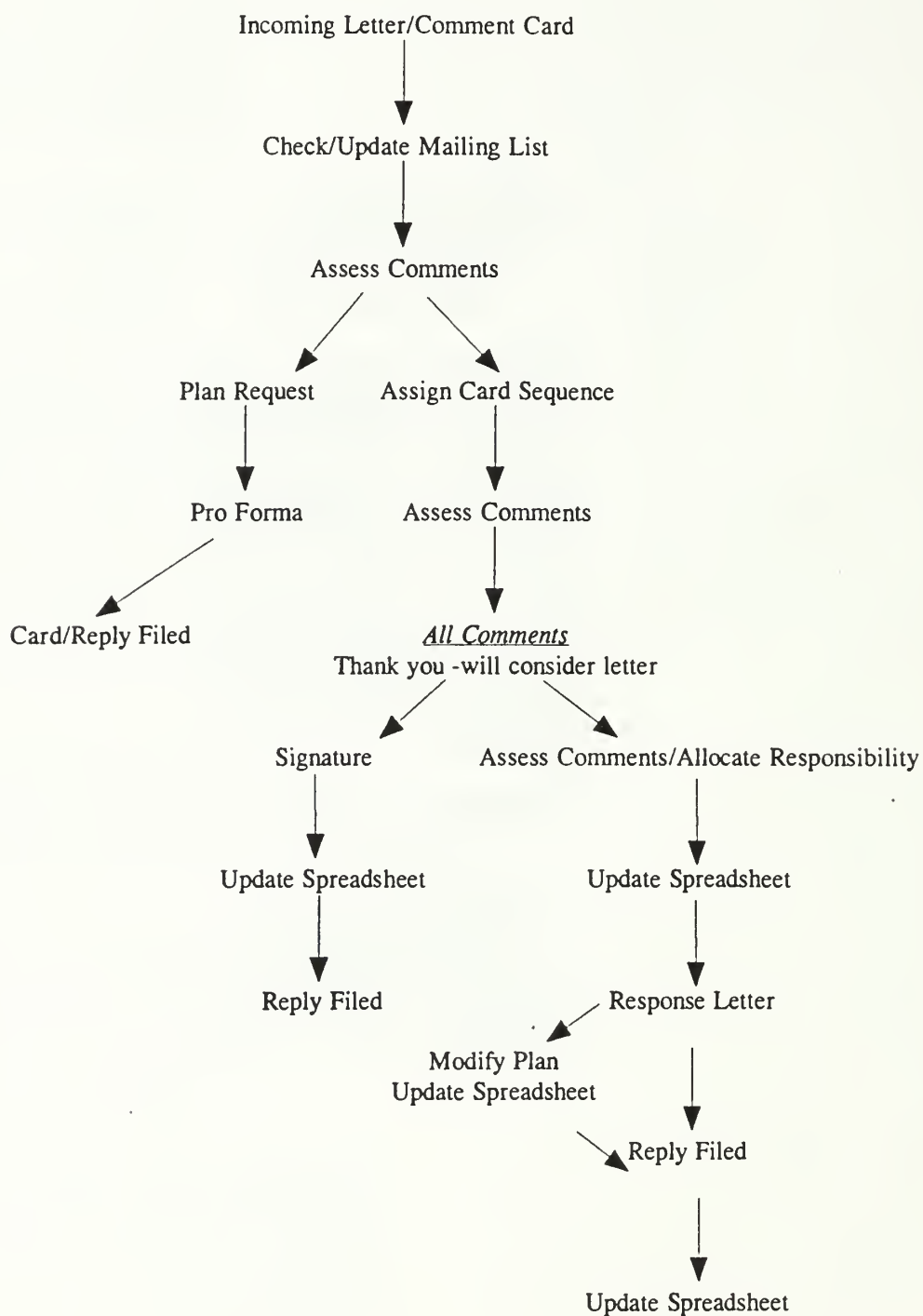
Elements of the Plan will be presented by the Director of the Bureau of Transportation Planning & Development. The meeting will be hosted by the Massachusetts Regional Planning Commission.

The meeting will be held:
September 27, 1994
7:00 PM

at
Montachusett Regional
Planning Commission
R1427 Water Street
Fitchburg, Massachusetts
For further information call
(508) 345-7376.
September 25, 1994

Exhibit D-4

Letter/Comment Card Tracking Process



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